Republic of South Africa

EDICT OF GOVERNMENT

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VC 8020 (2003) (English): Compulsory specification for frozen rock lobster and frozen lobster products derived therefrom [By Authority of South Africa Government Gazette 04-Jul-2003]

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Compulsory Specification for

Frozen rock lobster and frozen lobster products derived therefrom

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GOVERNMENT NOTICE

DEPARTMENT OF TRADE AND INDUSTRY

No. R. 978 **4 July 2003**

STANDARDS ACT, 1993

WITHDRAWAL AND REPLACEMENT OF THE COMPULSORY SPECIFICATION FOR FROZEN ROCK LOBSTER AND FROZEN LOBSTER PRODUCTS DERIVED THEREFROM

I, Alexander Erwin, Minister of Trade and Industry, hereby under Section 22(1)*(a)(i)* of the Standards Act, 1993 (Act No. 29 of 1993), and on the recommendation of the Council of the South African Bureau of Standards, withdraw the compulsory specification for Frozen Rock Lobster and Frozen Rock Lobster Products derived therefrom and replace it with the compulsory specification as set out in the Schedule, with effect from the date 2 months after the date of publication of this notice.

A ERWIN
Minister of Trade and Industry

SCHEDULE

COMPULSORY SPECIFICATION FOR FROZEN LOBSTER AND FROZEN LOBSTER PRODUCTS

1 Scope

This specification covers requirements for the handling, preparation, processing, packaging, freezing, storage and quality of frozen lobster tails, frozen whole lobster (cooked or raw) or any other frozen lobster product derived from lobsters of the families Palinuridae and Scyllaridae, and of the family Nephropidae (genera *Homarus*, *Nephrops* and *Metanephrops*, or any other species of lobster), intended for human consumption. It also covers requirements for factories and employees involved in the production.

2 Definitions

For the purposes of this specification, the following definitions apply:

2.1
acceptable
acceptable to the authority administering this specification

2.2
by-product
a product not intended for human consumption

2.3
chill room
an insulated and refrigerated room that is specially designed for the storage of foods at temperatures not lower than –1 °C and not higher than 4 °C, that has sufficient refrigeration capacity to maintain the desired storage temperature and that could also have sufficient refrigeration capacity to cool products placed in the chill room to that temperature

NOTE Where the product is to be stored with ice in a chill room, the above definition is not applicable.

2.4
factory
any premises in which the product (see 2.17) is prepared or processed (or both), and including, to the extent to which the requirements of this specification can be applied, a factory ship on which the product is frozen after preparation and processing

2.5
freezer
a room or equipment that is specially designed to lower the temperature of a food product through the zone of maximum crystallization, which, for most products, lies between –1 °C and –5 °C, and down to an equilibrium temperature of –20 °C or lower, in a period of time that is acceptable for the product

2.6
freezer storage room
an insulated freezer room that is specially designed for the storage of frozen foods and that has sufficient freezing capacity to maintain a product temperature of –20 °C or lower when products that have already been frozen to that temperature are being stored

NOTE A freezer storage room is not designed to freeze products.

2.7
freezing process
the continuous process whereby the temperature of the product is lowered through the zone of maximum crystallization, which, for most products lies between –1 °C and –5 °C, at a rate of at least 6 mm of product thickness per hour, and that is only completed when the temperature of the entire product, after thermal stabilization, has reached –20 °C or lower

2.8
frozen lobster for catering purposes
catering packs
packed and frozen lobsters or lobster tails, certain of which might be slightly damaged but all of which are of acceptable quality and in every way fit for human consumption

NOTE The product may be presented graded or ungraded.

2.9
frozen lobster tails
lobster tails that have undergone a freezing process and that have been preserved by storage in the frozen state

2.10
frozen product
a product (see 2.17) that has been preserved by storage in the frozen state

2.11
frozen whole cooked lobster
a whole cooked lobster that has undergone a freezing process and that has been preserved by storage in the frozen state

2.12
frozen whole raw lobster
a whole raw lobster that has undergone a freezing process and that has been preserved by storage in the frozen state

2.13
lobster product
any commodity made from lobster, with or without other ingredients, and intended for human consumption

2.14
outer container
master container
the box, carton or case into which packages of frozen lobster products, with or without wrappers, are packed for storage and distribution

2.15
package
immediate container
the immediate carton, plastics pouch or other container into which the product is packed for storage and distribution

2.16
preserve
to maintain in sound edible condition by the prevention of deterioration

2.17
product
whole lobster, cooked or raw, or lobster tails or other lobster products for human consumption, in the

course of transportation, handling, preparation, processing or packaging for freezing, in the course of being frozen, or after having been frozen, as indicated by the context of the specification

2.18
production
the handling, preparation, processing or packaging for freezing, in the course of being frozen, or after having been frozen, including the process of frozen storage, as indicated by the context of the specification

2.19
purge
to hold live lobster in clean, running sea water for at least 72 h in order to empty and clean the intestine

2.20
shredded lobster
comminuted lobster
lobster flesh of which the original muscle structure was broken up during the process of recovery of the flesh from the shell

2.21
soft-shelled lobster
lobster in the early post-moult stage, as evidenced by the presence of a soft new shell (exoskeleton) after the shedding of the old, and in which

- the gill-covering region of the carapace or branchiostegite is still soft or uncalcified, and can be easily torn or damaged or more or less permanently depressed on physical handling, and

- the flesh is high in water content to the extent that it does not possess the characteristic springiness of lobster flesh when in sound condition, and turns mushy or crumbly when cooked

2.22
suitable
acceptable and complying with the requirements for the intended purpose

2.23
suitable corrosion-resistant material
water-impermeable material that has smooth surfaces that are free from pits, crevices and scale, that is non-toxic and that is unaffected by sea water, ice, fish slime and any other corrosive substance with which it is likely to come into contact and that is capable of withstanding exposure to repeated cleaning, including the use of detergents

2.24
suitable measuring instrument
in the case of a digital instrument, an instrument that has a resolution of at least one tenth of the tolerable negative error; in the case of an analogue instrument that allows for interpolation between discrete divisions, an instrument that has a division size equal to at least one fifth of the tolerable error

3 Requirements for the factory

3.1 General

All the statutory requirements contained in the Occupational Health and Safety Act, 1993 (Act 85 of 1993), in the Health Act, 1977 (Act 63 of 1977), in the Perishable Products Export Control Act, 1983 (Act 9 of 1983), and in any other relevant Acts shall be complied with.

3.2 Factory construction, layout and conditions

3.2.1 Location, size, hygienic design and conditions

3.2.1.1 The location of the factory shall be such that the buildings can be kept acceptably free from objectionable odours, smoke, dust and other contamination, in order to comply with the relevant requirements for hygiene and sanitation of the Health Act, 1977 (Act 63 of 1977). The factory buildings shall be of sound construction, in good repair, and large enough to prevent crowding of equipment and employees and to permit adequate cleaning and the maintenance of product quality and hygiene.

3.2.1.2 The factory premises shall be well drained and adequately fenced to keep out larger animals, such as cats and dogs, and also unauthorized persons and vehicles. Outdoor work areas and roads and pathways on the premises shall have a permanent surface of concrete, brick, bitumen or other durable material. Areas outside buildings and not in actual use shall either be covered by lawn or have a surface that is not liable to produce dust and that does not contain toxic substances.

3.2.1.3 The factory and equipment shall be so designed as to permit the processing of raw materials without undue delay. The buildings shall be so designed and constructed as to prevent the entry and harbouring of insects, birds, rodents and other vermin.

3.2.2 Roofs and ceilings

3.2.2.1 Roofs shall be weatherproof and made of non-absorbent material. Roofs and, where applicable, ceilings shall fit tightly to the walls and shall be at least 2,4 m above the floor. In the preparation, processing and packaging areas, the roof and, where applicable, the ceiling shall be at least 300 mm above any equipment and high enough to allow the free movement of mobile equipment and moving parts of other equipment.

3.2.2.2 In the preparation, processing and packaging areas and in storage areas for ingredients and packaging materials for the product, the ceiling, or, where no ceiling is provided, the roof, shall be dustproof and faced with a suitable corrosion-resistant, light-coloured and water-impermeable material that is so constructed and finished as to minimize condensation, mould development, flaking and the lodgement of dirt, and that is capable of being cleaned without damage. The under side shall have a smooth surface.

Areas where sauce is prepared or where the cooked product is handled, or where ingredients and packaging materials are stored, shall have a ceiling.

3.2.3 Walls and doors

3.2.3.1 Outer walls shall be weatherproof and impermeable to water. Interior wall surfaces shall be faced with a smooth, light-coloured, washable material that is impermeable to water and free of unnecessary projections. In addition, the walls in the preparation, processing and packaging areas shall be faced with a suitable corrosion-resistant, light-coloured, washable and impact-resistant material to a height of 2 m above the floor, except that when soiling of the walls could occur above this height, the facing shall be continued to a higher level. All ledges on the inside of walls and all windowsills shall be sloped towards the floor at an angle of at least 45°. The ledges shall be kept to a minimum size and windowsills shall be at least 1 m above floor level. In the preparation, processing and packaging areas and in freezers, chill rooms and freezer storage rooms, the wall-to-wall and wall-to-floor junctions shall be coved, the minimum radius of the coving being 25 mm and 40 mm respectively.

3.2.3.2 Doors and door frames shall be sheathed with, or made from, a suitable corrosion-resistant material and shall have seamless, light-coloured, water-impermeable and washable surfaces. If wood is used, it shall be sheathed to render it impermeable to water. Doors through which the product is moved between the preparation, the processing and the packaging areas shall be wide enough to prevent contamination of the product and damage to the doors. All doors that open direct from the outside atmosphere into the preparation, processing and packaging areas shall be provided with effective air screens or shall, as far as is practicable, be self-closing and tight-fitting. Freezer, chill room and freezer storage room doors shall be tight-fitting.

3.2.4 Floors

3.2.4.1 Floors shall be constructed of concrete or other material that is suitably impermeable to water, corrosion resistant and easy to clean, and that has an even surface that is smooth but not slippery, and that is free from cracks and open joints.

3.2.4.2 Floors of the preparation, processing and packaging areas and of freezers, chill rooms and freezer storage rooms shall be suitably sloped and shall be drained to external gullies, sumps and sewers. Outlets shall have, immediately outside the factory walls, a trap that prevents the entry of rodents.

3.2.4.3 Drainage channels shall be of the open type with removable covers, where necessary, and shall be designed to cope with the maximum expected flow of liquid without overflowing or causing flooding. There shall be no installations in a drainage channel that could obstruct the flow of water or the cleaning activities. Gully traps shall be fitted with easily removable strainers. Where necessary, duckboards of easily cleaned, water-impermeable material shall be provided. Wooden duckboards shall not be used in wet areas. Floors and drains shall be maintained in good condition and repair.

3.2.5 Lift cages and staircases

3.2.5.1 The inside surfaces of lift cages shall be suitably corrosion resistant, and lift shafts shall be properly drained and accessible for cleaning. Mesh doors may be used, provided that they are not such as to be conducive to unhygienic conditions.

3.2.5.2 Staircases in rooms where the product is prepared, processed, packaged or handled shall have the spaces between treads closed in with solid risers. Staircases shall have solid balustrades of such a height as to prevent contamination of products underneath the stairs.

3.2.6 Cables and pipes

3.2.6.1 Cables and pipes shall, where applicable, be

a) fixed above ceilings, or

b) chased into walls, or

c) fixed away from walls and ceilings and above the floor, and spaced in such a way that the ceilings, walls, floor, cables and pipes can be easily cleaned and maintained in a hygienic condition, or

d) carried under the floor.

3.2.6.2 Drainage and sewer pipes shall not be installed above ceilings in preparation, processing or packaging areas, nor shall they be installed in such a way that accidental leakages could contaminate the product. The drainage and sewer pipes shall have an inside diameter of at least 100 mm and shall be properly vented to the outside atmosphere.

3.2.7 Illumination

An illumination of at least 220 lx in general work areas and at least 540 lx at points where close examination of the product is carried out, shall be provided and shall be such that it does not significantly alter the appearance of the colour of the product. Luminaires suspended over the work areas where the product is handled at any stage during preparation, processing or packaging shall be of the safety type or otherwise so protected as to prevent contamination of the product in the event of breakage of a luminaire or lamp.

3.2.8 Ventilation

The ventilation shall be such that it keeps the air fresh, removes excess water vapour, and that it

prevents the build-up of excessive heat, the formation of condensate and the growth of mould on overhead structures. The air shall be free from noxious fumes, vapours, dust and contaminating aerosols. The airflow shall be from the more hygienic to the less hygienic areas. Natural ventilation shall be augmented, where necessary, by mechanical means.

Windows that open for ventilation purposes shall be insect-screened. The screens shall be easily removable for cleaning, and shall be made from suitable corrosion-resistant material.

3.2.9 Hand-washing facilities

3.2.9.1 The following shall be provided at the entrances to the preparation and processing areas of the factory that are used by the employees, and at other conveniently situated places in the preparation and processing areas of the factory within easy reach of the employees, and at the toilet exits:

a) an acceptable number of wash-hand basins, with an abundant supply of hot and cold, or warm running water in the temperature range 40 °C to 50 °C, and that complies with the requirements of 3.4.1;

b) an ample supply of unscented liquid soap or acceptable detergent in active condition;

c) disposable paper towels or hot-air driers; and

d) taps operated by means other than the hands or elbows, for example knee-operated or foot-operated taps, or push-button taps with preset volume control.

3.2.9.2 Disinfectant hand dips, where provided, shall be of such a design that they can be adequately cleaned. Access to hand-washing facilities shall at all times be unobstructed. The wash-hand basins shall be of a suitable corrosion-resistant material, shall have a smooth finish and shall drain into drainage channels direct.

3.2.9.3 In the case of a factory ship, at least one wash-hand basin in the toilet block and one in the processing and packaging area shall be supplied with hot and cold running water.

3.2.10 Footbaths

Unless their absence in particular circumstances is acceptable, or unless alternative acceptable cleaning and disinfecting facilities are provided, footbaths that contain a suitable disinfectant solution shall be provided at each entrance to the preparation, processing and packaging areas that is used by employees, and shall be so located that employees cannot obtain access to those areas without disinfecting their footwear. Footbaths shall be so constructed that they can be adequately drained and cleaned.

3.2.11 Notices

Notices shall be strategically displayed in the preparation, processing, packaging and storage areas, in the changerooms and in the toilet facilities. The notices shall require that hands be washed with soap or detergent and shall indicate that spitting, the use of chewing gum and of tobacco in any form, and the taking of refreshments are prohibited in those areas.

3.2.12 Separation of processes and facilities

The areas where the raw product and the cooked product are handled shall be physically separated from each other. There shall be no cross-flow of raw and cooked production operations.

Separate rooms or well-defined areas of acceptable size shall be provided for

a) the receipt and storage of raw materials,

b) preparatory operations such as the detailing, removal of the anal canal and washing of lobster,

c) processing operations such as freezing,

d) packaging, and

e) the storage of the product.

3.2.13 Stores

3.2.13.1 General

The production area of the factory shall not be used for storage purposes.

3.2.13.2 Edible ingredients

Storage facilities for edible ingredients used in the preparation of the frozen product shall be dry, free from dust and any other source of contamination, and shall be verminproof.

3.2.13.3 Packing and packaging materials

Clean, dustproof, verminproof and dry storerooms shall be provided for the storage of packaging materials.

3.2.13.4 Storage facilities for poisonous and other harmful materials

3.2.13.4.1 Storage facilities for pesticides or other poisonous and harmful materials

Pesticides or other poisonous and harmful materials and the equipment for their application shall be stored in a room in which no foodstuff, food-handling equipment, packaging material or food containers are stored and which shall be kept locked. All dangerous materials shall be prominently and distinctly labelled and shall at no time come into contact with food containers, packaging materials, raw materials or the product.

3.2.13.4.2 Storage facilities for cleaning and disinfecting materials

Cleaning and disinfecting materials and the equipment for their application shall be stored in a room in which no foodstuff, food-handling equipment, packaging material or food containers are stored and shall at no time come into contact with food containers, packaging materials, raw materials or the product. All cleaning and disinfecting materials shall be prominently and distinctly labelled.

3.2.14 Storage facilities for utensils and spare parts

Utensils and spare parts that, when in use, come into contact with the product, shall, when not in use, be kept in a disinfectant solution or stored in a hygienic manner in a dry area that is free from dust and any other source of contamination, and that is verminproof. Spare parts for machinery that are capable of contaminating the product shall be kept in a separate storage area away from the processing areas.

3.2.15 Freezers, chill rooms and freezer storage rooms

3.2.15.1 Refrigeration units, such as compressors, shall not be installed in an area where the product is handled, with the exception of equipment that is an integral part of a production unit. Where freezers, chill rooms and freezer storage rooms are located in processing areas, their floors shall either be an integral part of the floor of the processing area or be adequately sealed to that floor. Any storage units shall be installed high enough above the floor to permit easy and adequate cleaning of the area under them.

3.2.15.2 The walls and floors shall be in good condition. The surfaces of ceilings, walls and floors shall be of suitable corrosion-resistant material, shall be impermeable to water and shall be smooth, and free from cracks, crevices and flaking of surface material. The floors shall be drainable, and the floors of chill rooms shall be sloped to effect complete draining.

3.2.15.3 Freezer storage rooms shall be equipped with automatic temperature recorders that have enough suitably placed sensing elements to monitor the overall air temperature. The temperature in freezer storage rooms shall be automatically and continuously monitored and a record of the temperature shall be kept and shall be available for inspection. Temperature charts shall be so graduated that each division represents not more than 2 °C within the storage range, and shall be easily readable, to the nearest 1 °C, within the storage range. Batch freezers, other than plate freezers, shall be fitted with external gauges or other temperature indicators.

3.2.15.4 The entrances to freezers, chill rooms and freezer storage rooms shall be protected from the inflow of warm air by the provision of an anteroom or a mechanical air curtain or strip curtains or self-closing shutters.

3.2.16 By-products

Any processing of by-products that are not intended for human consumption shall be conducted in buildings that are physically separated from the factory in such a way that there is no possibility of contamination of the product.

3.2.17 Living quarters

Living quarters shall be completely separated from areas where the product is prepared, processed, packaged or stored.

3.2.18 Refuse

A separate, suitable refuse facility shall be provided on the premises and shall be cleaned daily.

3.2.19 Comfort facilities

3.2.19.1 An acceptable number of suitable changerooms, shower baths, wash-hand basins whose taps operate as described in 3.2.9, toilets (separate for each sex) and, where appropriate, urinals, shall be provided within practical distance from the factory processing areas. Shower baths shall connect direct to the changerooms. Comfort facilities shall not open direct into a preparation, processing, packaging or storage area.

3.2.19.2 Toilets shall be completely separate from changerooms, the only permissible access being through close-fitting self-closing doors. Toilet blocks shall have their own hand-washing facilities, separate from those provided in changerooms. An ample supply of toilet paper, hot and cold running water, nailbrushes, unscented liquid soap or an acceptable detergent solution, and disposable paper towels shall be available to employees. Receptacles shall be provided for used towels. Refuse bins of hygienic construction shall be provided.

3.2.19.3 Notices shall be posted requiring employees to wash their hands with soap or detergent after they have used the toilet. Lockers or controlled clothes baskets shall be provided, and the layout and equipment shall be such as to permit proper cleaning and maintenance. The comfort facilities shall be kept clean and tidy. The comfort facilities shall be adequately ventilated. Changerooms and dressing rooms shall not be used as living quarters or for the preparation of meals. Staff dining rooms shall be separate from the changerooms and dressing rooms.

3.2.20 Facilities for cleaning and disinfecting portable equipment

Facilities with proper drainage shall be provided for the cleaning and disinfecting of portable equipment. Such facilities shall be located in a separate room or in a designated area in the preparation,

processing and packaging areas where there is an ample supply of cold potable water, and hot water where required, or saturated steam, or clean sea water that complies with the requirements of 3.4.2.

3.3 Equipment for production

3.3.1 General

3.3.1.1 Processing areas shall be so designed, equipped and staffed as to allow free movement of workers to facilitate cleaning and the maintenance of both hygiene and product quality.

3.3.1.2 All plant, equipment and utensils that come into contact with the product shall be smooth surfaced, light coloured and of a suitable corrosion-resistant, non-absorbent material (i.e. not wood or other absorbent or porous material), which may have an acceptable plastics-coated surface suitable for use with food but should preferably be made of stainless steel. They shall be of hygienic design with no open joints or crevices and shall be so constructed as to facilitate their cleaning and disinfecting. Plant and equipment shall be so designed as to facilitate the cleaning and disinfecting of the areas under them. Open ends and curled edges shall be satisfactorily sealed to prevent the accumulation of organic material and dirt. Where necessary, as in the case of equipment that cannot be cleaned *in situ*, it shall be possible to dismantle the equipment for cleaning and disinfecting. Surfaces with which the product comes into contact shall not be painted.

3.3.1.3 All parts of stationary equipment or equipment that is not readily movable shall be installed away from the walls and ceilings, at a distance sufficient to provide access for cleaning and inspection. All permanently mounted equipment shall be either installed high enough above the floor to allow access for cleaning and inspection, or shall be completely sealed to the floor.

3.3.1.4 Equipment shall preferably not be sunk into the floor but, if this is unavoidable, the installation of the equipment shall be such as to be acceptable. Sunken areas shall be well drained.

Copper, lead and their alloys (other than solder), and other metals or materials detrimental to health or to the product shall not be used in the construction of equipment that comes into contact with the raw materials or with the unprotected product at any stage of its processing. The use of solder in equipment shall be minimized.

3.3.2 Tables

Wooden tables shall not be used in processing areas. Table frames shall be of a design and construction that will not allow the development of unhygienic conditions and bacterial build-up. The frames shall be made of smooth corrosion-resistant metal or shall have been so coated as to protect them from corrosion. Table tops shall be of seamless stainless metal or other seamless, corrosion-resistant, smooth, water-impermeable material that possesses similar surface characteristics. They shall be of hygienic construction and shall be either removable for cleaning, or so secured to their frames as to allow cleaning and disinfecting. Where metal tops are folded at the edges, the folds shall be so soldered, welded, or sealed with an acceptable mastic sealant as to prevent the accumulation of organic matter and dirt. All table tops shall allow rapid and effective drainage, and shall be free from cracks and crevices. All joints in tables shall have been made watertight.

3.3.3 Cutting boards

If cutting boards are used, they shall be of hygienic construction and shall be made of acceptable light-coloured material (other than wood or other absorbent or porous material), suitable for use with food. Cutting boards shall be easily removable.

3.3.4 Utensils

Knives, shovels, brooms and other utensils shall not have handles of wood or of other porous material. Wicker baskets shall not be used as containers for lobsters at any stage before, during or after processing.

3.3.5 Disinfecting and cleaning facilities

Disinfecting facilities for gloves and knives shall be available at convenient and acceptable points. Cleaning and disinfecting materials, hot and cold running water or saturated steam, hose pipes, spray nozzles, brushes, scrapers and other equipment needed for the cleaning of the plant, equipment and utensils shall be available. These materials and equipment shall not be stored in a room where food-handling equipment is stored and shall at no time come into contact with raw materials, the products or their containers or packages.

3.3.6 Ice-making equipment

All surfaces of ice-making equipment that come into contact with the ice shall be of suitable corrosion-resistant material. The ice-making equipment shall be of hygienic construction throughout. Whenever ice is transferred, stored or transported, it shall be effectively protected from contamination.

3.4 Water

3.4.1 Potable water

3.4.1.1 Subject to the provisions of 3.4.2, every factory shall have an adequate supply of clean potable water that is free from suspended matter and substances that could be deleterious to the product or harmful to health. In addition, the water shall have been so treated, by flocculation, filtration, chlorination or other acceptable processes, as to ensure compliance with the following requirements:

a) **coliform organisms:** the count of coliform organisms shall not exceed five organisms per 100 mℓ of the water (see 10.16); and

b) **faecal coliform bacteria:** faecal coliform bacteria shall not be detectable in 100 mℓ of the water (see 10.16).

3.4.1.2 For the purposes of the water examination, coliform group shall include all gram-negative, non-spore-forming rods capable of fermenting lactose with the production of acid and gas at 37 °C in less than 48 h. Faecal coliform bacteria shall be regarded as gram-negative, non-spore-forming rods capable of fermenting lactose with the production of acid and gas at both 37 °C and 44 °C in less than 48 h, and of producing indole in tryptone water.

3.4.1.3 Chlorinated water that could have any deleterious effect on the product shall be dechlorinated immediately before use. In all cases, the free residual chlorine concentration shall be determined by the *N,N*-diethyl-1,4-ℓ-phenylenediamine test or other acceptable test that has equivalent sensitivity.

3.4.1.4 Factory installations for the treatment of water shall be thoroughly cleaned at least once a week by an acceptable method.

3.4.2 Sea water

Clean, uncontaminated, freshly pumped sea water may be used for any purpose in the factory, provided that the count of coliform organisms does not exceed 50 organisms per 100 mℓ of the water (see 10.16) and no faecal coliform bacteria are detectable in 100 mℓ of the water (see 10.16).

3.4.3 Water for cleaning

Water used for the cleaning of the plant and equipment shall comply with the requirements of 3.4.1 or 3.4.2, as relevant. Chlorinated water that could have any deleterious effect on the product shall be dechlorinated immediately before use. In all cases, the free residual chlorine concentration shall be determined by the *N,N*-diethyl-1,4-ℓ-phenylenediamine test or other acceptable test that has equivalent

sensitivity.

3.4.4 Ice

The purity of ice shall be such that the water derived from it (by melting the ice under aseptic conditions at a temperature not exceeding 10 °C) immediately after the ice has been manufactured, complies with the microbiological requirements of 3.4.1 or 3.4.2, as relevant.

3.5 Requirements for employees engaged in the handling, preparation, processing, packaging and storage of the product

3.5.1 Health

3.5.1.1 Before being engaged, employees shall pass an appropriate medical examination to ensure that they are free from communicable diseases, and they shall thereafter pass an annual medical examination. In the case of any absence of more than one day owing to illness, the employee shall, before resuming duty, report the nature of the illness which necessitated the absence to the factory hygiene officer who shall, should he deem it necessary, take the appropriate steps to obtain a medical opinion on the employee's fitness for work. An appropriate medical record of each employee shall be kept.

3.5.1.2 Any medical certificate submitted by an employee of a factory shall be available for inspection by the authority administering this specification.

3.5.1.3 No employee who is a carrier of, or is suffering from, any communicable disease, especially a carrier of *Salmonella* or *Shigella*, or one who shows symptoms of, or is suffering from, gastro-enteritis or an enterobacterial infection or a disorder or condition that causes discharge of fluid from any part of the skin or body, shall be allowed to come into contact with the product. Any such employee shall immediately report to the factory management.

3.5.1.4 No employee who is known to be affected with a disease that is capable of being transmitted through food shall be permitted to work in any part of the factory in a capacity in which there is a likelihood that the employee will contaminate the product with pathogenic organisms.

3.5.1.5 No employee who is suffering from any cut or injury shall be allowed to come into contact with the product unless the cut or injury has been so treated or dressed that the discharge of body fluid has been prevented, and the wound and its dressing have been so covered as to ensure that infection or contamination of the product is no longer possible.

3.5.2 Protective clothing

3.5.2.1 All employees engaged in the handling, preparation and processing of the product up to and including the packaging stage, but excluding employees operating within freezer storage rooms and chill rooms, shall wear clean, light-coloured, protective clothing, waterproof aprons, waterproof slipovers or boots, and clean, washable or disposable headgear that completely covers their hair. Woollen caps may be worn in freezer storage rooms only. Overalls shall completely cover the personal clothing of the employees.

3.5.2.2 Sleeves shall not extend below the elbows, except when covered by plastics sleevelets or when worn in freezer storage rooms and chill rooms. Waterproof protective clothing shall be of a plastics or rubber material or a similar acceptable material. All protective clothing shall be of hygienic design, shall have no external pockets, shall be in good repair and shall not constitute a source of contamination to the product.

3.5.2.3 Protective clothing, other than waterproof aprons, sleevelets and gloves, shall not be stored in work areas; when not in use, it shall be kept in changerooms and shall not be removed from the premises except for laundering under hygienic conditions. The homes of employees shall not be regarded as acceptable for this purpose.

3.5.2.4 Waterproof aprons, sleevelets and gloves shall be cleaned at each time of removal and as frequently as necessary, and shall be hung on hooks or pegs at exits from production areas during intervals between work and during visits to the toilet. Gloves shall be thoroughly cleaned and then disinfected by the use of chlorinated water or other acceptable solution or procedure. Waterproof aprons, sleevelets and gloves, and also all equipment used in the preparation, processing and packaging of the product, shall not be removed from the work areas except for repairs and for cleaning under hygienic conditions.

3.5.3 Personal hygiene

3.5.3.1 Before starting work, and after each absence from the factory production area, at regular intervals during production, or at any time when necessary, employees shall wash their hands with warm water and acceptable unscented liquid soap or detergent and rinse them in clean, running water. They may then dip their hands in an acceptable disinfectant solution, after which they shall rinse their hands in clean running water, if so required by the directions for use of the hand dip. Neither varnish nor lacquer shall be used on fingernails, and fingernails shall be kept short and clean. Jewellery shall not be worn by employees who handle raw materials or the unprotected product or both.

3.5.3.2 Neither employees' personal effects nor their food shall be present in any area where the product and its ingredients and packaging materials are handled or stored. Containers used in the preparation, processing or packaging of the product shall not be used for any other purpose.

3.5.3.3 The use of chewing gum and of tobacco in any form shall not be permitted within the areas where the product and its ingredients and packaging materials are handled or stored. No food or beverage shall be prepared or consumed by employees in these areas. Spitting shall not be allowed anywhere within the factory premises. Notices to these effects shall be posted strategically (see 3.2.11).

3.5.4 Visitors

Any person, including employees who visit or enter the production, processing or packaging areas of the factory during the hours of operation, shall, when in those areas, comply with all hygiene requirements and shall wear clean protective clothing that shall be provided by the factory.

3.6 Hygienic operating requirements

3.6.1 General

3.6.1.1 In relation to the handling, transportation, processing, packaging, freezing and storage of the product, no operation(s) shall be performed and no conditions shall exist that are detrimental to the product. Materials liable to contaminate the product shall be kept away from the processing areas. Non-edible materials shall not be stored in the same room as edible ingredients or in the preparation or packaging areas of the factory.

3.6.1.2 There shall be no unhygienic conditions on the factory premises. Smoke from factory chimneys and exhaust fumes shall not be allowed to enter the factory building(s) in a quantity or manner that is offensive, injurious or dangerous to health, or that causes contamination of the product at any stage during the processing of the product.

3.6.2 Cleaning and disinfecting

3.6.2.1 Physical facilities

3.6.2.1.1 The building, premises, plant, equipment, utensils and all other physical facilities of the factory shall be kept clean and in good repair and shall be maintained in an orderly hygienic condition. The cleaning and disinfecting of the preparation, processing and packaging areas of factories and of all auxiliary equipment and utensils shall be organized on a regular basis and shall be carried out by trained employees. Before use, plant, equipment and utensils shall be thoroughly cleaned with a detergent or other cleaning agent, and disinfected. A detergent-disinfectant may be used. Immediately before the start of any operations, equipment shall be thoroughly rinsed with water (see 3.4.3) to remove any dust and any disinfectant (if used).

3.6.2.1.2 The processing and packaging areas, storage rooms, chill rooms, freezer storage rooms and freezers shall be kept free from mould, dust, dirt, flaking paint and other loose or extraneous material that could fall onto the product from walls, ceilings or overhead structures.

3.6.2.2 Floors and drainage channels

During periods of operation, the floors and the drainage channels in the preparation, processing and packaging areas shall be kept clean by regular sweeping, scrubbing and flushing with water. Refuse shall not be permitted to accumulate in drainage channels or on grids. Thorough cleaning of floors and drainage channels shall take place as often as is necessary and at the end of each day's operations, in order to maintain hygienic conditions. Footbaths shall be drained and cleaned regularly and the disinfectant shall be kept in an active condition.

3.6.2.3 Walls of preparation, processing and packaging areas

The walls of preparation, processing and packaging areas shall, where necessary, be thoroughly washed immediately after each day's operations and the rooms shall be kept as free from dust as possible.

3.6.2.4 Cleaning and disinfecting materials

Cleaning and disinfecting materials, hot and cold running water that complies with the requirements of 3.4.3, saturated steam, hose pipes, brushes and other materials and equipment necessary for the cleaning of the factory, equipment and utensils shall be available. Cleaning materials, such as scouring wool, that could contaminate the product shall not be used.

3.6.2.5 Cleaning of water treatment installations

Factory installations for the treatment of water shall be thoroughly cleaned once a week by an acceptable method.

3.6.2.6 Cleaning of the processing system

The entire processing system shall be cleaned during each break in production that lasts for more than 1 h, or whenever it is deemed to be necessary, and shall be effectively cleaned at the end of each shift and at the end of each day's operations. It shall be clean at the time of further use.

3.6.2.7 Cleaning of utensils

Knives, breaking pins and similar items of equipment shall, during breaks in production, after use, or at any time when disinfection is necessary, be thoroughly cleaned and then disinfected by the use of chlorinated water or other acceptable solution or procedure. When the factory is in operation, equipment and utensils shall not be removed from the work area except for repair, cleaning or replacement.

3.6.2.8 Cleaning of the discharge system

Any discharge system at the jetty and any conveyance system to the factory shall be so drained that stagnant water does not collect. Such systems shall be regularly cleaned of stale material and cleaned before and after use. Holding tanks shall be similarly treated.

3.6.3 Repairs

3.6.3.1 Whenever maintenance or repairs have been carried out in production areas, tools and replaced equipment shall be immediately removed from these areas and the affected equipment shall be thoroughly cleaned and disinfected.

3.6.3.2 Welding repairs in the areas where the product is handled, prepared, processed or packaged shall be performed when the plant is not in production or as emergency work during breakdown only, and in such a way that the product is not exposed to welding fumes, splatter or slag particles.

3.6.4 Efficacy of cleaning

The efficacy of the cleaning and disinfecting process specified in 3.6.2 shall be such that, in samples taken in accordance with 10.15, the percentage efficacy of cleaning and disinfecting in the sample, determined in accordance with 10.15, is acceptable when scored by the system set out in 10.15.

3.6.5 Containers, bins and crates for the handling of raw material and the product

When filled or partly filled with raw material or with the product, containers shall not be stacked in a way that allows contact of the contents of a container with the bottom of the container stacked above it. Containers that hold edible materials shall not be stacked direct on the floor or against the wall, and whenever they are moved, they shall be effectively protected from contamination. Containers that hold edible materials shall be stored at least 250 mm above floor level. Where pallets are used instead of racks, shelves or stands, there shall be a clearance of at least 100 mm above floor level. Containers shall be of hygienic design and shall either be light coloured or have a bright metallic finish. Non-edible materials shall not be stored in the same room as edible ingredients or in the preparation or processing areas of the factory.

3.6.6 Wrapping materials

Wrapping materials used during the packaging of the product shall be kept in corrosion-resistant containers of hygienic construction, and shall be so dispensed, that the wrappers require only minimum handling.

3.6.7 Packaging materials

Materials for the packaging of the product shall be stored on racks/shelves at a distance of at least 250 mm from the floor or on pallets, and away from the walls.

3.6.8 Spare parts

Spare parts for machinery, and other items that are capable of contaminating the product, shall be stored away from the preparation, processing, packaging and product storage areas.

3.6.9 Freezers, chill rooms, freezer storage rooms and their equipment and instruments

Freezers, chill rooms, freezer storage rooms and their equipment and instruments shall operate efficiently and shall be kept clean and in a hygienic condition. The temperature in freezer storage rooms shall be automatically and continuously monitored and a record of the temperature shall be kept and shall be available for inspection. Products shall not be stacked direct on the floor or against the walls. No material other than the product or ingredients of the product shall be stored in freezers, chill rooms or freezer storage rooms. No condition and no object or matter that could affect the flavour,

odour or appearance of the frozen product in any way shall be present in freezers, chill rooms and freezer storage rooms.

3.6.10 Removal of refuse and offal

Litter, waste and overflow shall not be allowed to accumulate or to give rise to unhygienic conditions, and shall be disposed of promptly in an efficient and hygienic way. Offal shall be removed from the processing area in a hygienic manner, and containers for offal awaiting removal from the factory area shall be well separated from the processing areas. A separate refuse room or other acceptable refuse facility shall be provided on the premises, and shall be cleaned at least once a day.

3.6.11 Vermin control

All buildings in which raw materials, ingredients and the product are stored, or in which the product is handled, prepared, processed or packaged shall be kept free from insects, birds, rodents and other vermin. All rooms in which raw materials, ingredients or packaging materials are stored, shall, in addition, be rodentproof.

3.6.12 The use of pesticides

Pesticides shall not be used in work areas while preparation, processing and packaging are in progress, and precautions shall be taken to ensure that equipment and work surfaces are kept free from pesticide residues. Pesticides and cleaning chemicals shall at no time be allowed to come into contact with wrapping material, containers, raw materials or the product. The room in which pesticides are stored shall be kept locked and the materials contained in it shall be handled only by employees trained in their use.

3.6.13 Animals

Animals, including birds, shall not be allowed in any part of the factory.

3.7 Records

Adequate quality records shall be maintained. Quality records and records of freezer storage temperatures shall be kept for a period of at least two years (see 3.2.15.3).

4 Requirements for the ingredients and the product

4.1 General

4.1.1 Condition of ingredients and the product

4.1.1.1 General

All ingredients used shall fall within the scope of, and shall comply with the requirements of, the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), and its Regulations. All ingredients used in the preparation of the product shall be clean, sound, of good quality and in every way fit for human consumption. In addition, the product shall not contain any substance in amounts that might present a hazard to human health.

4.1.1.2 Salt

Salt used in the preparation of the product shall be edible, free from bitterness and other off-odours and off-flavours, discoloration and impurities.

4.1.1.3 Seasoning

Seasoning ingredients shall be free from foreign matter and adulterants.

4.1.1.4 Additives

Only permitted additives shall be used, and then only in the permitted quantities.

4.1.2 Requirements for importing countries

In order to meet the requirements of an importing country, products for export may be packed to requirements that deviate from those laid down in this specification, subject to the following conditions:

a) prior written application for the packaging of the product in accordance with the proposed deviation shall be made to the authority administering this specification, full details of the intended deviation being furnished;

b) the deviation shall not, in the opinion of the authority administering the specification, after consultation with organizations representing the industry, result in the packing and exporting of a product of doubtful quality or of such nature as to affect deleteriously the Republic of South Africa's export image in the market concerned; and

c) the product shall be accurately described on its container or label and the labelling or marking shall not be misleading to the consumer.

4.2 Transportation of whole lobsters and lobster tails to processing and freezing plants

4.2.1 General

Transportation of whole lobster to processing and freezing plants, which shall be done in accordance with the relevant regulations of the Sea Fishery Act, 1988 (Act 12 of 1988), shall be performed under clean and hygienic conditions, and the product in transit shall be fully protected from contamination by dust and other foreign matter and from the heat of the sun. Lobster shall not be transported under conditions that adversely affect or impair the product. Lobster shall not be transported with other products. Means of transport used for lobster shall not be used for other products likely to impair or contaminate the lobster. The inside surfaces of the means of transport shall be so finished that they do not adversely affect the lobster. The inside surfaces shall be smooth and easily cleaned and disinfected. The lobsters shall be kept moist, cool and alive. Coverings used over unprotected raw material shall not rest on the raw material direct. The method of transportation, and the manner in which lobsters are held during transportation, shall be such that the lobsters are not damaged in any way.

Suitable measuring instruments shall be used to measure temperatures specified in the following clauses.

4.2.2 *Whole lobsters*

Whole lobsters shall be alive upon arrival at the packing plant. For the attainment of this, provision of refrigeration during transportation might be necessary. Neither fresh-water ice nor ice water shall be allowed to come into contact with the lobsters during such transportation.

4.2.3 Lobster tails

Lobster tails shall not be transported in the unfrozen state unless:

a) they have been properly gutted and washed;

b) they are individually well wrapped, graded and packed in their final containers;

c) they are refrigerated to a temperature not lower than –1 °C and not higher than 4 °C and transported to nearby freezing facilities within 5 h after being packaged; and

d) the transportation vehicle is of hygienic construction.

4.3 Packing of lobsters and lobster tails

Only lobsters or lobster tails of the same species shall be packed together in any one container.

4.4 Condition of lobsters

4.4.1 General

A lobster shall at no time be held under adverse conditions of storage, for example in corrugated iron structures that are subjected to direct sunlight. If, after landing, lobsters cannot be removed to processing factories without undue delay, or have to be held at a packing plant (or both), they shall be kept alive either by submersion in clean running sea water or by being held at an ambient temperature in the range 4 °C to 12 °C.

4.4.2 Soundness

Lobsters shall be alive at the time of, or immediately prior to, tailbreaking or, when applicable, immediately prior to cooking, processing and freezing. Lobsters or lobster tails that are only slightly damaged or broken to a minor extent, may be used for catering packs, provided that they are in every other way of acceptable quality and fit for human consumption. Lobsters with hanging tails, uncharacteristic odour or uncharacteristic flesh colour shall be deemed to be unacceptable.

4.4.3 Soft shell (new shell) and berry

A soft-shelled lobster, a lobster in berry or a lobster that has been stripped of berry or that does not comply with statutory requirements shall not be used in the product.

4.5 Frozen whole raw lobster

4.5.1 Before being packed as frozen whole lobster, a live lobster of the *Jasus* species shall be purged. However, should the market require unpurged frozen whole lobster, special dispensation to market lobster of the *Jasus* species in this way shall be requested from the authority administering this specification. In the case of lobsters of other species, the product may consist of unpurged lobsters, subject to the declaration of this fact in the labelling or marking of the product (see 6.1(b)(2) or (3)).

4.5.2 A lobster shall be alive until immediately before being processed, when it shall be killed.

4.5.3 Lobsters shall be neatly and individually wrapped and neatly packed, and then frozen in accordance with 5.3. Alternatively, lobsters may be frozen and then glazed before being wrapped and packed.

4.5.4 Lobsters shall be graded for size and lobsters in any one container shall be acceptably uniform in size. Where lobsters are not graded for size, this fact shall be conspicuously declared on all main

panels of immediate containers and master containers.

4.5.5 A lobster may be packed in an ice block, provided that it is completely covered with the ice. There shall be no cracks or other flaws in the ice.

4.6 Frozen whole cooked lobster

4.6.1 The requirements for purging that are applicable to frozen whole raw lobster shall apply (see 4.5.1).

4.6.2 The requirements of 4.5.2 shall apply.

4.6.3 Immediately after being killed, the lobsters shall be cooked, rapidly cooled, scrubbed in cold fresh running water (that complies with all the requirements of 3.4.1) or sea water (that complies with all the requirements of 3.4.2), drained, graded where applicable, neatly and individually wrapped and neatly packed, and then frozen in accordance with 5.3. Alternatively, the product may be frozen and then glazed before being wrapped and packed. When graded, the lobsters in any one container shall be acceptably uniform in size.

4.6.4 After having been thawed, the product shall be such that it is consumable without further cooking.

4.7 Frozen lobster tails

4.7.1 Provided that they comply with the requirements of 4.4.2, lobsters may be held in a chilled condition while awaiting tailbreaking and further processing. The conditions of chilling shall not be such as to affect deleteriously the odour, flavour, colour or appearance of the product.

4.7.2 After the tails have been severed from the bodies, the gut shall be removed immediately in an hygienic manner and the tails very thoroughly washed to remove all traces of free blood. The washing shall be done in running water that complies with the requirements of 3.4.1 or 3.4.2, as relevant. Thereafter, the tails shall be graded where applicable, neatly and individually wrapped, neatly packed, and frozen without delay. Tails shall show no discoloration of whatever nature or origin. When it is necessary to hold the gutted, washed and graded tails under refrigeration awaiting final packing, the chilling of the tails shall begin immediately after gutting and washing, and the final freezing of the product shall start within 5 h of the beginning of the intermediate chilling. The nature and duration of the chilling shall be such as to not affect deleteriously the odour, flavour, colour or appearance of the product.

4.7.3 Whole lobster intended for the packing of tails shall not be subjected to intermediate freezing before further processing, but tails that have been properly gutted, washed, graded and individually wrapped may be frozen as an intermediate step before final packing, mass adjustment and refreezing. Such tails may, with a view to repacking, mass adjustment and final freezing, be warmed (when necessary) in an acceptable way to allow separation of units, provided that the internal temperature of the tails does not rise above –7 °C.

4.7.4 Lobster tails from deep-sea species may, where necessary during preparation for freezing, be treated with an antioxidant, such as sulfur dioxide or ascorbic acid, permitted by regulation under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), in order to prevent melanosis of the flesh, shell and telson (tail fin). The treatment of the tails shall not cause the flavour of the cooked product to be uncharacteristic of the species concerned.

4.7.5 Except in the case of tails intended for packing for catering purposes, tails shall be graded by mass or by length, as appropriate. The count of tails in any container, as determined in accordance with 8.4, shall be in accordance with the declaration on the container. The tails in any one container shall be acceptably uniform in size and, as far as is practicable within any category, the mass of each tail shall fall within the mass range obtained by dividing the sum of the declared net mass of the

appropriate package unit and the minimum overpack (see 4.9) by the corresponding maximum and minimum counts for that category.

4.7.6 Lobster tails in catering packs may be presented graded or ungraded for size, but this shall be declared on the main panel of the label. Provided that the flesh is firm and sound, some minor defects to the shell of such tails may be present. In every other respect, tails in catering packs shall comply with the quality, wrapping, packing and labelling requirements of this specification.

4.8 Shredded or comminuted lobster

Only the flesh from the carapaces of lobsters that were active at the time of tailbreaking shall be used. Unless the lobsters are properly washed immediately and stored in hygienic containers at a temperature not exceeding 4 °C, or in frozen condition while awaiting further processing or transportation in vehicles of hygienic construction to nearby processing plants, the recovery of the flesh from the carapaces shall follow immediately upon the breaking of the tails. The product shall have a characteristic colour, shall show no discoloration of any nature and shall be free from pieces of shell and other foreign matter. Lobsters belonging to different species shall not be used together in the manufacture of the product.

4.9 Overpacking of lobster tails, frozen whole raw lobster and frozen whole cooked lobster

Adequate provision for overpacking shall be made to compensate for loss of mass during frozen storage, transportation and distribution.

4.10 Chemical requirements

When tested in accordance with 9.1 to 9.7, the product shall comply with the relevant requirements of the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972).

4.11 Microbiological requirements

When tested in accordance with the methods given in 10.6 to 10.14, the product shall comply with the requirements given in column 2 or column 3 of table 1, as relevant.

Table 1 — Microbiological requirements

1	2	3
Organism	**Contents**, max.	
	Raw products[1]	**Cooked products**[2]
Standard plate count	1×10^6/g	1×10^5/g
Enterobacteriaceae	[3]	100/g
Presumptive E. coli	Nil/10 g	Nil/10 g
Staphylococcus aureus	10/g	10/g
Salmonella	Nil/25 g	Nil/25 g
Shigella	Nil/25 g	Nil/25 g
Clostridium perfringens	Nil/25 g	Nil/25 g
Vibrio cholerae	Nil/25 g	Nil/25 g
Vibrio parahaemolyticus	Nil/25 g	Nil/25 g
Listeria monocytogenes	[3]	Nil/25 g

1	2	3
Organism	**Contents**, max.	
	Raw products[1)]	**Cooked products**[2)]
1) Products that require cooking before being consumed. 2) Products that only require thawing and reheating before being consumed. 3) Not to be tested.		

4.12 Antibiotics

Antibiotics shall not be used in the preparation of the product.

5 Packaging, glazing, freezing, storage and net mass of product

5.1 Packaging and wrapping materials and containers

5.1.1 Packaging and wrapping materials

Subject to the relevant requirements of the Regulations promulgated under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), packaging and wrapping materials for the unprotected product shall be unused (new), clean, non-toxic, inert and of low moisture-vapour permeability, and shall not contain substances deleterious to the product or harmful to health. Wrappers for tails shall bear a true description of the product. Any description that appears on such a wrapper shall not conflict with the requirements of clause 6. Wrappers shall be of such size as to cover the tails adequately, thereby ensuring that, when frozen, the tails do not stick to one another and are protected from freezer burn. No packaging or wrapping material shall impart a flavour to, or in any way cause discoloration of, the product, or be itself discoloured by contact with the product.

Packaging materials shall

a) not be such as to impair the organoleptic characteristics of the product,

b) not be capable of transmitting substances injurious to the product or harmful to human health, and

c) be strong enough to protect the product adequately.

5.1.2 Outer containers

Only fibreboard or other acceptable containers shall be used. The containers shall be unused (new), clean and intact, and shall be neatly and securely closed. Wooden outer containers shall not be made of green wood and shall not contain substances injurious to the product or harmful to health. Outer containers shall be so securely closed as to prevent contamination of the contents by dust or other foreign matter and shall be strong enough to protect the product adequately.

5.2 Glazing

The product may be glazed with chilled water or other acceptable glazing agent as a substitute for wrapping, provided that the glaze is maintained in an acceptable condition up to and including the final point of sale. When the product is glazed, the coating of ice shall cover the product completely to ensure that dehydration and oxidation are minimized. Water used for glazing shall comply with the requirements for potable water (see 3.4.1) or sea water (see 3.4.2), and its temperature shall be 5 °C or lower.

5.3 Freezing

The stacking of products in freezers (other than plate freezers) shall be away from floor and wall surfaces and shall be such that air circulation between packages is not impeded. The freezing capacity of every plant shall be capable of freezing the product to –5 °C or lower within 8 h of its being placed in the freezer. The freezing process shall start with the minimum of delay after preparation and packing. Freezing capacity shall not be overtaxed. The freezing and the frozen storage of the product shall be carried out in a way that will obviate freezer burn.

5.4 Frozen storage

5.4.1 Records of the temperature of freezer storage rooms shall be retained for at least two years from the date of recording, and shall be available for inspection by the authority administering this specification. (See also 3.2.15.3.)

5.4.2 The product shall be stored and maintained at a temperature of –18 °C or lower. If, at any time during storage, the temperature of the product rises above this temperature, it shall be rapidly lowered to –18 °C. If the temperature rises above –7 °C, the product shall, in addition, be resubmitted for inspection to the authority administering this specification. Products that, before dispatch for sale, are held for periods exceeding those specified in table 2 shall, prior to preparation for dispatch, be resubmitted for inspection to the authority administering this specification.

Table 2 — Maximum storage time for products at specified temperatures without reinspection

1	2	3
Product	**Storage temperature**	
	–20 °C	–25 °C
	Maximum storage time without reinspection months	
Whole lobster packed in gauze	6	8
Whole lobster packed in blocks of ice	12	18
Whole lobster packed in plastics	9	12
Lobster tails wrapped in plastics	12	18

5.5 Condition of frozen product

5.5.1 General

On thawing, when examined in accordance with 8.1, the frozen product shall be clean, shall have an attractive, characteristic appearance, shall in every way be sound, intact, and free from defects, and the flesh shall have a springy texture. There shall be no off-odours and other indications of deterioration of the product, or of the use of inferior quality raw materials. The product shall be free from foreign matter, foreign odours, discoloration and freezer burn (deep dehydration). There shall be no evidence of an inadequate freezing process or of deterioration. The flavour of the cooked product, whether the product was packed raw or cooked, shall be normal and typical of the species. The texture of the cooked product, whether the product was packed raw or cooked, shall be succulent, firm and springy and otherwise characteristic of the species.

5.5.2 Frozen lobster tails

The shell of lobster tails shall be intact. The telsons (tail fins) shall not be broken or damaged. The colour of the flesh shall be uniform (either pinkish or translucent) and there shall be no loss or change in colour and no discoloration. Gut (anal canal) shall not be present.

5.5.3 Frozen whole lobster (raw, cooked or packed in ice)

Broken legs shall be virtually absent but, when present, shall be packed with the product. Exuded body fluids and spilled feed shall not be perceptible. The shell of lobsters shall be intact. The telson (tail fin) shall not be broken or damaged. The units shall not be distorted or twisted. Frozen whole lobster shall have been adequately purged (see 4.5.1). The units shall be free from discoloration.

6 Marking

6.1 Marking on containers that are not for export (see 6.2)

Except as allowed for in terms of 6.2, the following information shall appear on the outside of each container, in legible and indelible marking in a type face of such size and presentation as prescribed by the Regulations promulgated under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act 54 of 1972), and the Trade Metrology Act, 1973 (Act 77 of 1973):

a) the name and full physical address of the manufacturer, producer, proprietor or controlling company or, in the case of containers packed for any other person or organization, the name and full physical address of that person or organization;

b) the appropriate of the following product names, all words being given in bold letters of equal size, except that the word "unpurged" or its equivalent may be in letters of size at least one-third of that in which the product name appears:

   1) in the case of frozen rock lobster tails prepared (and packed) from the Cape rock lobster *(Jasus lalandii)*, the inscription "South African rock lobster tails"; in the case of frozen lobster tails prepared (and packed) from South Coast lobster *(Palinurus gilchristi)*, the inscription "South African rock lobster tails, South Coast type"; in the case of frozen lobster tails prepared (and packed) from Natal lobster *(Palinurus delagoae)*, the inscription "Natal rock lobster tails"; in the case of frozen lobster tails prepared (and packed) from slipper lobster (Scyllaridae), the inscription "Slipper lobster tails"; and in the case of frozen lobster tails prepared (and packed) from any other species of lobster, a true and appropriate description that will not mislead the consumer;

   2) in the case of frozen whole raw Cape rock lobster *(Jasus lalandii)*, the inscription "Whole raw South African rock lobster"; in the case of frozen whole raw South Coast lobster *(Palinurus gilchristi)*, the inscription "Whole raw South African rock lobster, South Coast type"; in the case of frozen whole raw Natal lobster *(Palinurus delagoae)*, the inscription "Whole raw Natal rock lobster"; in the case of frozen whole raw slipper lobster (Scyllaridae), the inscription "Whole raw slipper lobster"; in the case of frozen whole raw lobster of any other species, a true and appropriate description that will not mislead the consumer; and in the case of frozen whole raw lobster packed unpurged in terms of the allowance made in 4.5.1, the word "unpurged" or its equivalent, given in immediate conjunction with the product name;

   3) in the case of frozen whole cooked rock lobster prepared (and packed) from the Cape rock lobster *(Jasus lalandii)*, the inscription "Whole cooked South African rock lobster"; in the case of frozen whole cooked lobster prepared (and packed) from South Coast lobster *(Palinurus gilchristi)*, the inscription "Whole cooked South African rock lobster, South Coast type"; in the case of frozen whole cooked lobster prepared (and packed) from Natal lobster *(Palinurus delagoae)*, the inscription "Whole cooked Natal rock lobster"; in the case of frozen whole cooked lobster prepared (and packed) from slipper lobster (Scyllaridae), the inscription "Whole cooked slipper lobster"; in the case of frozen whole cooked lobster prepared (and packed) from any other species of lobster, a true and appropriate description that will not mislead the

consumer; and in the case of frozen whole cooked lobster packed unpurged in terms of the allowance made in 4.5.1, the word "unpurged" or its equivalent, given in immediate conjunction with the product name; and

4) in the case of a frozen rock lobster product other than frozen rock lobster tails, frozen whole raw rock lobster and frozen whole cooked rock lobster, a true and appropriate description of the product, including the name of the product and the presentation of the contents;

c) the date of manufacture and the identity of the factory in which the product was packed; the use of a code is permissible provided that the key to such code is disclosed to the authority administering this specification (the code may also identify the quota holder on whose behalf the product was packed);

d) in the case of products for sale in the Republic of South Africa, the net mass of the contents, where applicable (in accordance with the Regulations promulgated under the Trade Metrology Act, 1973 (Act 77 of 1973));

e) in the case of tails other than those in catering packs, the category identification (see 4.7);

f) the country of origin;

g) where applicable, words indicating that the pack is a catering pack;

h) the presence of the antioxidant(s), by name, on the immediate containers, and where appropriate, on the master containers;

i) words stating clearly and legibly that the product shall be stored at a temperature of –20 °C or lower;

j) where applicable, a list of the ingredients, in descending order of content;

k) a statement that the product is cooked or uncooked, as applicable, and instructions for storage, given in the following manner, as relevant:

- Uncooked (or raw) – Keep frozen
- Partly cooked – Keep frozen. Do not refreeze once thawed
- Cooked – Keep frozen. Do not refreeze once thawed;

l) if the product has been glazed with sea water, a statement to this effect prominently displayed on the main panel of the label, in immediate conjunction with the name of the product;

m) where relevant, directions for use; and

n) any labelling requirement specifically called for by regulation.

The trade name of a product shall not be misleading to the consumer.

6.2 Labels

6.2.1 The information required in 6.1 shall be printed on each individual package or on the overwrap covering of such a package, or on a label of acceptable material attached to the package.

6.2.2 Labels on packages shall be clean and neat and securely attached. They shall not be superimposed on other labels or on matter printed direct on the packages. They shall not be applied by any person other than the manufacturer or his authorized agent.

6.2.3 Labels or sealing adhesives that are liable to deteriorate under the conditions of storage of the packaged products shall not be used.

6.3 Marking on outer containers that are not for export (see 6.4)

6.3.1 Outer containers shall be clean, neat and unbroken, and on every such container (carton, box, etc.) shall be printed or stencilled the quantity and size or net mass of the packages it contains and the information required by 6.1(a), (b), (d) and (k), except that the physical address required by 6.1(a) need not be the full physical address but shall be sufficient for identification purposes. The method of preparation need not be given on the outer container.

6.3.2 The date of manufacture, the identity of the factory and the batch number (if applicable) shall be stamped or otherwise indelibly marked on the outer container or on a label securely attached to the outer container, or on a packing slip inserted into the outer container. A code may be used for the date of manufacture, provided that the key to the code is disclosed to the authority administering this specification.

6.4 Marking on outer containers and packages for export

Outer containers and packages for export shall be marked in accordance with the requirements of the importing country and may be marked differently from the requirements of 6.1 and 6.3, provided that there is no attempt to misrepresent the contents. Details as required by 6.1(c) shall be printed on each outer container and package.

7 Delivery and inspection

7.1 General

The requirements of 7.2 and 7.3 shall be subject to the requirements of the applicable statutory Acts and Regulations.

7.2 Delivery

7.2.1 General

The delivery of frozen products shall take place under hygienic conditions that will not adversely affect the quality of the product.

7.2.2 Delivery for export

The frozen product for export shall be conveyed from the factory to the freezer storage depot and delivered into the transporting vessel's freezer storage facilities at a temperature of –18 °C or lower. If, at any time during this transportation, the temperature of the product rises above –18 °C, it shall be lowered to the required temperature as rapidly as possible. The product shall be reinspected if the temperature has risen above –7 °C.

7.2.3 Delivery for local sale

The frozen product for local distribution shall be conveyed in refrigerated or insulated trucks from the factory or the freezer storage depot to the point of retail sale. The temperature of the product during local transportation shall, except at the outer surfaces of a stack, be –20 °C or lower. Refrigerated trucks shall be fitted with at least one thermometer that is so installed as to be readable from outside the refrigerated compartment.

7.3 Inspection for export

Each consignment of the frozen product intended for export shall be available for inspection at the freezer storage depot from which it is to be shipped. The authority administering this specification shall be notified at least 5 d before the expected date of shipment of the product. Products that do not comply with this specification shall not be kept in those freezer storage rooms from which export is effected, unless clearly identified. The frozen product shall be submitted for reinspection at the point of shipment if, while the product was stored, whether at the original packing plant or at the point of shipment, or while the product was being transported to the point of shipment, any doubt arose as to the temperature history or the quality of the frozen product.

8 Methods of physical examination

8.1 Organoleptic examination

8.1.1 Examination

Examine the product for compliance with the requirements in 5.5 after thawing (see 8.1.2) and after cooking (see 8.1.3).

8.1.2 Procedure for thawing

Thaw the sample unit by enclosing it in a film-type pouch and immersing the pouch in water at room temperature (not exceeding 35 °C). Alternatively, the sample unit may be thawed by exposure to air at ambient temperature of 20 °C ± 5 °C. The complete thawing of the sample is determined by gently squeezing the bag occasionally (so as not to damage the texture of the lobster), until no hard core or ice crystals are left.

8.1.3 Cooking methods

8.1.3.1 Steaming procedure

Wrap the sample unit in aluminium foil and place it on a wire rack suspended over boiling water in a covered container until the internal core temperature of the sample unit is between 65 °C and 70 °C.

8.1.3.2 Boil-in-bag procedure

Place the sample unit into a boilable film-type pouch and seal the pouch. Immerse the pouch in boiling water until the internal core temperature of the sample unit is between 65 °C and 70 °C.

NOTE The exact times and conditions of cooking or steaming of the sample should be determined by prior experimentation.

8.2 Determination of the net mass of frozen products other than glazed products

8.2.1 Immediately after removal of the package from frozen storage, remove any ice adhering to the outside of the package and determine the gross mass of the unopened package.

8.2.2 Remove the packaging material. Wash, dry and determine the mass of the packaging material. Record the difference between the gross mass (see 8.2.1) and the mass of the packaging material as the net mass of the frozen product.

8.3 Determination of the net mass of a glazed product

8.3.1 Immediately after removal of the package from frozen storage, place the contents of the package in a container into which fresh potable water (see 3.4.1) at ambient temperature is introduced from the bottom at a flow rate of approximately 5 ℓ/min. Leave the product in the water until all surface ice has melted. If the product is block-frozen, turn the block over several times during deglazing; probe the block and remove units from the water as they become loose.

8.3.2 After all the glaze that can be seen or felt has been removed and the units separate easily, transfer the contents of the container (see 8.3.1) to a tared sieve of nominal aperture size approximately 2 mm. Incline the sieve at an angle of approximately 20° and drain for 2 min.

8.3.3 Record the mass of the material remaining on the sieve as the net mass of the glazed product.

8.4 Determination of count of tails

Examine the product for compliance with 4.7.5.

9 Methods of chemical analysis

9.1 Determination of ascorbic acid content

9.1.1 Reagents[1)]

9.1.1.1 Distilled water.

9.1.1.2 Metaphosphoric acid (HPO_3)/acetic acid extracting solution

Dissolve, with shaking, 15 g of HPO_3 pellets or freshly pulverized stick HPO_3 in 40 mℓ of glacial acetic acid and 200 mℓ of water and filter rapidly through a fluted paper into a glass bottle of capacity 500 mℓ. Immediately stopper the bottle, using a glass stopper. (HPO_3 slowly hydrolyses to orthophosphoric acid (H_3PO_4), but if stored in a refrigerator, the solution remains satisfactory for 7 d to 10 d.)

9.1.1.3 Ascorbic acid standard solution, 1 mg/mℓ

Accurately weigh out 50 mg of ascorbic acid that has been stored in a desiccator away from direct sunlight, transfer it quantitatively to a 50 mℓ volumetric flask and dilute to volume with water.

NOTE Prepare this solution afresh immediately before each set of tests.

9.1.1.4 Indophenol standard solution

9.1.1.4.1 Dissolve 50 mg of the sodium salt of 2,6 dichlorophenol (indophenol), that has been stored in a desiccator over soda lime out of direct sunlight, in 50 mℓ of water containing 42 mg of sodium bicarbonate. Shake vigorously and, when the salt is dissolved, transfer quantitatively to a 200 mℓ volumetric flask and dilute to volume with water. Filter through a fluted paper into an amber glass bottle. Immediately stopper the bottle and store in a refrigerator.

NOTE Decomposition products that make the end-point indistinct occur in some batches of dry indophenol and can also develop with time in the above standard solution. Test the indophenol solution immediately after preparation and at weekly intervals, as follows: add 5,0 mℓ of the extracting solution containing excess ascorbic acid to 15 mℓ of the indophenol standard solution. If the reduced solution is not virtually colourless, discard the old indophenol solution, prepare a fresh indophenol standard solution and retest. If the solid indophenol is at fault, obtain a new supply.

9.1.1.4.2 Transfer three 2,0 mℓ volumes of the ascorbic acid standard solution (see 9.1.1.3) to each of three 50 mℓ Erlenmeyer flasks each containing 5,0 mℓ of the extracting solution (see 9.1.1.2). Titrate rapidly with the indophenol standard solution from a 50 mℓ burette until a light but distinct rose-pink colour persists for at least 5 s. (Each titration usually requires approximately 15 mℓ of indophenol solution, and titres should agree to within 0,1 mℓ.) Similarly titrate three blanks, each consisting of 7,0 mℓ of the extracting solution plus a volume of water approximately equal to the volume of indophenol solution used in the titration of the ascorbic acid solution, and determine the average titre of the blank solutions (usually approximately 0,1 mℓ). Correct the standardization titres by subtracting the average blank titre from each of them and calculate the ascorbic acid equivalent, in milligrams, of 1,0 mℓ of the indophenol standard solution. Standardize the indophenol solution daily against freshly prepared ascorbic acid standard solution.

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1) During the analysis and unless otherwise specified, only reagents of recognized analytical grade or (when such a grade is unobtainable) of the purest grade available, and only distilled or deionized water should be used.

9.1.2 Preparation of test solution of the product

Shred the product and transfer an appropriate accurately determined mass to a blending machine. Add an appropriate volume of the extracting solution and mix gently until a uniform suspension is obtained. Dilute with the extracting solution to a definite volume V_2, in millilitres, and mix thoroughly.

9.1.3 Procedure

Titrate, with the indophenol standard solution, three aliquots of the test solution, each containing approximately 2 mg of ascorbic acid, and conduct three blank determinations as in 9.1.1.4.2.

NOTE If the aliquots of test solution are of volume less than 7 mℓ, add, in each case before titration, enough of the extracting solution to raise the final volume to 7 mℓ.

9.1.4 Calculation

Calculate the ascorbic acid content, β, expressed in milligrams per kilogram of product, using the following formula:

$$\beta = (V - V_1) \times \frac{m}{m_1} \times \frac{V_2}{V_3} \times 1\ 000$$

where

β is the ascorbic acid content of the sample, in milligrams per kilogram;

V is the average sample titre, in millilitres;

V_1 is the average blank titre, in millilitres;

V_2 is the volume of the test solution (see 9.1.2), in millilitres;

V_3 is the volume of the aliquot of test solution titrated, in millilitres;

m is the mass, of ascorbic acid equivalent to 1,0 mℓ of indophenol standard solution, in milligrams; and

m_1 is the mass of the product in volume V_2 of the test solution, in grams.

Check for compliance with 4.10.

9.2 Determination of lead, copper, zinc and cadmium (atomic absorption spectrophotometric method)

9.2.1 Apparatus

9.2.1.1 Atomic absorption spectrophotometer. (Refer to the manufacturer's reference manuals for wavelength, slit width, flame conditions, etc.)

9.2.1.2 Crucible, platinum, of capacity 150 mℓ.

9.2.1.3 Water-bath.

9.2.1.4 Temperature controlled furnace.

9.2.2 Reagents

9.2.2.1 Hydrochloric acid, 1 N, prepared by diluting 89 mℓ of concentrated HCl to 1 ℓ with distilled water.

9.2.2.2 Lead standard solutions, as follows:

a) **stock standard solution**: 1 mg Pb/mℓ; and

b) **working standard solution**: 2,0 µg Pb/mℓ.

9.2.2.3 Copper standard solutions, as follows:

a) **stock standard solution**: 1 mg Cu/mℓ; and

b) **working standard solution**: 5,0 µg Cu/mℓ.

9.2.2.4 Zinc standard solutions, as follows:

a) **stock standard solution**: 1 mg Zn/mℓ; and

b) **working standard solution**: 3,0 µg Zn/mℓ.

9.2.2.5 Cadmium standard solutions, as follows:

a) **stock standard solution**: 1 mg Cd/mℓ; and

b) **working standard solution**: 1,0 µg Cd/mℓ.

9.2.3 Procedure

9.2.3.1 Preparation of sample solution

Weigh 12,5 g ± 0,1 g of sample into the crucible (see 9.2.1.2), and dry for 2 h at 135 °C to 150 °C. Transfer the crucible to a cold, temperature-controlled furnace and slowly raise the temperature to 450 °C. Ash the sample overnight (16 h). Remove the crucible and allow it to cool. Add 10 mℓ of the 1 N HCl and dissolve the ash by heating the crucible cautiously on a boiling water-bath. Transfer the contents of the crucible to a 25 mℓ volumetric flask. Heat the ash residue again successively with two 5 mℓ portions of the 1 N HCl and add it to flask. Cool, dilute to volume with the 1 N HCl, and mix. Reserve this solution for the determination of sulfur dioxide content as well (see 9.7).

9.2.3.2 Reagent blank

Prepare a reagent blank.

9.2.3.3 Determination of lead

Determine the absorbance of the sample solution, of the reagent blank and of the 2,0 µg Pb/mℓ working standard solution. If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the lead in the sample is less than 4 mg/kg. Check for compliance with 4.10.

9.2.3.4 Determination of copper

Dilute 10,0 mℓ of the sample solution to 50,0 mℓ with water. Determine the absorbance of the sample solution, of the reagent blank and of the 5,0 µg Cu/mℓ working standard solution. If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the copper in the sample is less than 50 mg/kg. Check for compliance with 4.10.

9.2.3.5 Determination of zinc

Dilute 1,0 mℓ of the sample solution to 50,0 mℓ with water. Determine the absorbance of the sample solution, of the reagent blank and of the 3,0 µg Zn/mℓ working standard solution. If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the zinc in the sample is less than 300 mg/kg.

Check for compliance with 4.10.

9.2.3.6 Determination of cadmium

Determine the absorbance of the sample solution, of the reagent blank and of the 1,5 µg Cd/mℓ working standard solution. If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the standard working solution, the cadmium in the sample is less than 3 mg/kg. Check for compliance with 4.10.

9.3 Determination of tin (atomic absorption method)

9.3.1 Apparatus

Atomic absorption spectrophotometer. (Refer to the manufacturer's reference manuals for wavelength, slit width, flame conditions, etc.)

9.3.2 Reagents

9.3.2.1 Tin standard solutions, as follows:

a) **stock standard solution**: 1 mg Sn/mℓ; and

b) **working standard solution**: 40,0 µg Sn/mℓ.

9.3.2.2 Potassium chloride solution, 10 mg K/mℓ, prepared by dissolving 1,91 g of KCl and diluting to 100 mℓ with distilled water.

9.3.2.3 Nitric acid (HNO_3), concentrated. Test the purity of a lot by diluting a portion to 1:4 (by volume) with distilled water and aspirating into an AA spectrophotometer. The absence of an Sn signal indicates suitability of the nitric acid for analysis.

9.3.3 Preparation of sample

Accurately (± 0,01 g) weigh 25 g of the sample into a 250 mℓ Erlenmeyer flask. Dry in an oven at 120 °C.

NOTE Do not add HNO_3 to samples (see below) unless there is time to complete this stage of digestion on the same day.

Add 30 mℓ of the concentrated HNO_3 to the flask and, within 15 min, heat gently in a hood to initiate digestion, avoiding excess frothing. Gently boil until 3 mℓ to 6 mℓ of digest remains or until the sample just begins to dry on the bottom. Do not allow the sample to char. Remove the flask from the heat. Without delay, continue as follows, simultaneously preparing two empty flasks for reagent blanks: add 25 mℓ of concentrated hydrochloric acid (HCl), and heat gently for about 15 min until sample bumping from the evolution of chlorine (Cl_2) stops. Increase the heat, and boil until a volume of 10 mℓ to 15 mℓ remains. Use a similar flask that contains 15 mℓ of water to estimate the remaining volume. Transfer the sample solution and the reagent blanks to 25 mℓ volumetric flasks. The sample solution and reagent blanks may stand overnight or longer.

Pipette 1,0 mℓ of the KCl solution into each volumetric flask. Cool to ambient temperature and dilute to volume with water. Mix well and filter the sample solution only through dry, medium porosity paper into a dry polypropylene or polyethylene screw-cap bottle. Transfer the blanks to similar bottles. Cap the bottles until analysis. Reserve this solution for the determination of arsenic as well (see 9.4).

9.3.4 Reagent blank

Use the reagent blank prepared in 9.3.3.

9.3.5 Procedure

Determine the absorbance of the sample solution, of the reagent blank and of the 40,0 µg Sn/mℓ working standard solution. If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the tin in the sample is less than 40 mg/kg. Check for compliance with 4.10.

9.4 Determination of arsenic (Gutzeit method)

9.4.1 Apparatus

See figure 1 and 9.4.3.

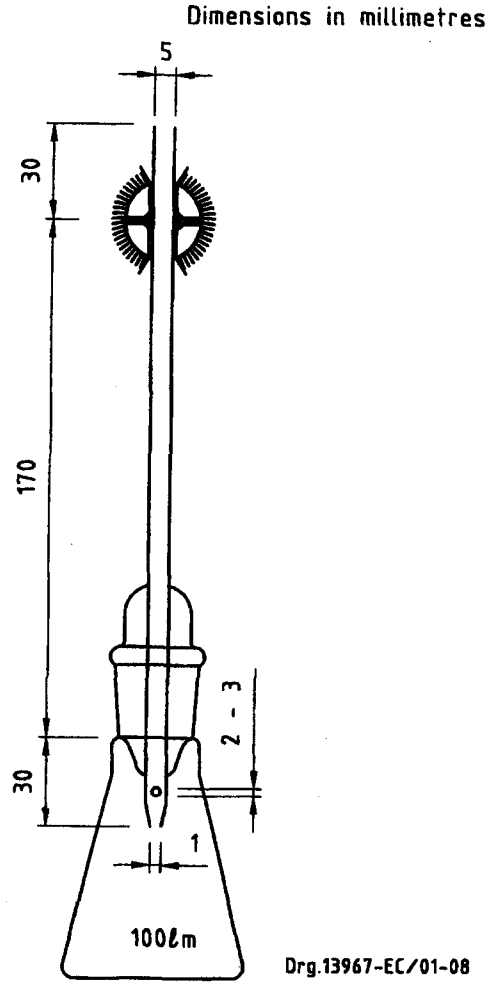


Figure 1 — Apparatus for limit test for arsenic

9.4.2 Reagents

9.4.2.1 Arsenic standard solutions, as follows:

a) **stock standard solution**: 1 mg As/mℓ; and

b) **working standard solution**: 1,0 µg As/mℓ.

9.4.2.2 Hydrochloric acid, concentrated.

9.4.2.3 Potassium iodide solution, a 16,6 g/100 mℓ aqueous solution of potassium iodide.

9.4.2.4 Tin (II) chloride solution, dissolve 33 g of tin (II) chloride (free from arsenic) in 10 mℓ of hydrochloric acid and sufficient water to produce 100 mℓ.

9.4.2.5 Mercury (II) bromide, mercuric bromide ($HgBr_2$ = 360,4 analytic reagent grade).

9.4.2.6 Mercury (II) bromide paper, prepared as follows: in a rectangular dish, place a 5 g/100 mℓ solution of mercury (II) bromide in absolute ethanol and immerse in it pieces of white filter paper of 80 g/m^2 (Whatman No. 1 is suitable), each measuring 200 mm × 15 mm and folded in two. Decant the excess liquid and allow the papers to dry, protected from light, by suspending them over a non-metallic thread. Cut away the folded edges to a width of 10 mm. Cut the remaining strips into 15 mm squares or discs of diameter 15 mm.

Mercury (II) bromide paper should be kept in a glass-stoppered container and protected from light.

9.4.2.7 Zinc, granulated.

9.4.2.8 Lead acetate solution, a 10 g/100 mℓ solution of lead (II) acetate in carbon dioxide-free water.

9.4.2.9 Lead acetate cotton, prepared as follows: immerse absorbent cotton wool in a mixture of 10 volumes of lead acetate solution and one volume of 2 M acetic acid. Drain off the excess liquid by placing the cotton wool on several layers of filter paper, without squeezing the cotton wool. Allow the cotton wool to dry at room temperature. Lead acetate cotton should be kept in an airtight container.

9.4.3 Procedure

9.4.3.1 Take 5,0 mℓ of the sample solution prepared for the determination of tin (see 9.3.3). The apparatus (see figure 1) consists of a 100 mℓ conical flask closed with a ground-glass stopper through which passes a glass tube of length approximately 200 mm and of internal diameter 5 mm. The lower part of the tube is drawn to an internal diameter of 1,0 mm and at a distance of 15 mm from its tip is a lateral orifice of diameter 2 mm to 3 mm. When the tube is in position in the stopper, the lateral orifice should be 2 mm to 3 mm below the lower surface of the stopper. The upper end of the tube has a perfectly flat, ground surface at right angles to the axis of the tube. A second glass tube of the same internal diameter and of length 30 mm, with a similar flat ground surface, is placed in contact and co-axially with the first, and is held in position by two spiral springs.

9.4.3.2 Into the lower tube, insert 50 mg to 60 mg of lead acetate cotton, loosely packed, or a small plug of cotton wool and a rolled piece of lead acetate paper of combined mass 50 mg to 60 mg.

9.4.3.3 Between the flat surfaces of the tubes, place one of the pieces of mercury (II) bromide paper (see 9.4.2.6).

9.4.3.4 In the conical flask, dilute 5,0 mℓ of the sample solution to 25 mℓ with water.

9.4.3.5 Add 15 mℓ of concentrated hydrochloric acid, 0,1 mℓ of tin (II) chloride solution, and 5 mℓ of potassium iodide solution, allow to stand for 15 min and then add 5 g of granulated zinc.

9.4.3.6 Immediately assemble the two parts of the apparatus and immerse the flask in a water-bath at a temperature such that a uniform evolution of gas is maintained. After not less than 2 h, any stain produced on the mercury (II) bromide paper shall be not more intense than that obtained by treating 3 mℓ of arsenic working standard solution (1 µg As/mℓ) diluted to 25 mℓ with water in the same way. The arsenic in the sample will then be less than 3 mg/kg.

Check for compliance with 4.10.

9.5 Determination of mercury

9.5.1 Apparatus

9.5.1.1 Atomic absorption spectrophotometer, fitted with a mercury hollow cathode lamp.

9.5.1.2 Cold vapour absorption cell, fitted in place of the burner of the spectrophotometer (see figure 2).

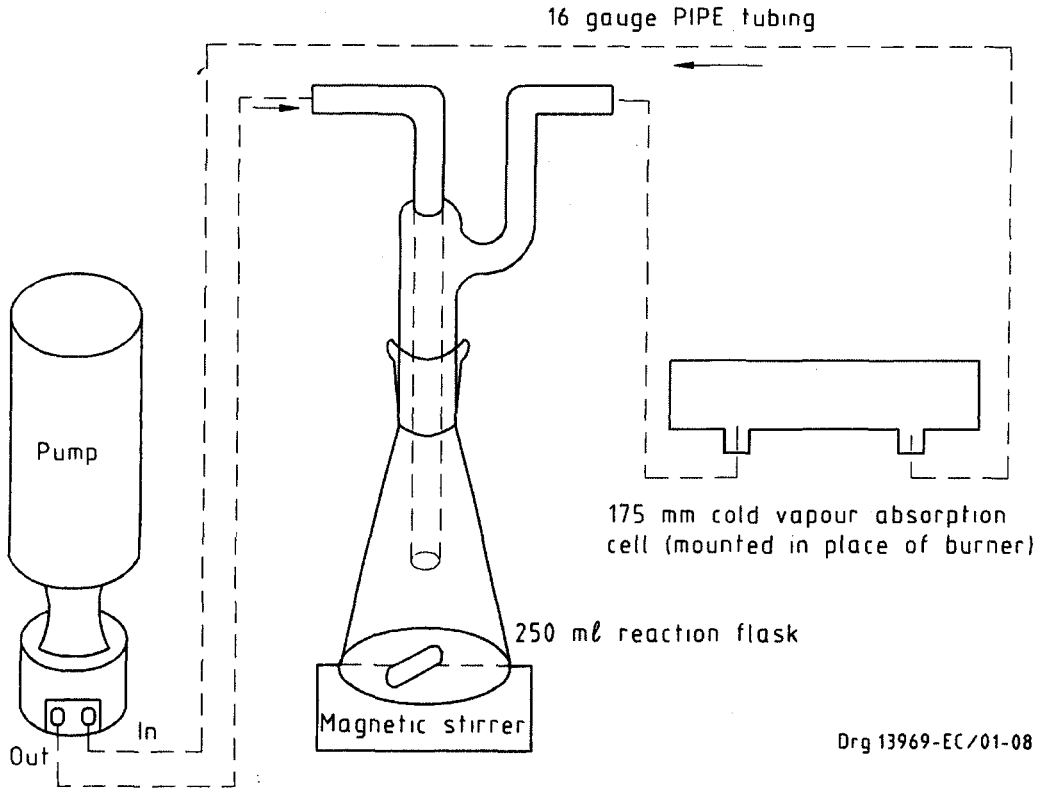
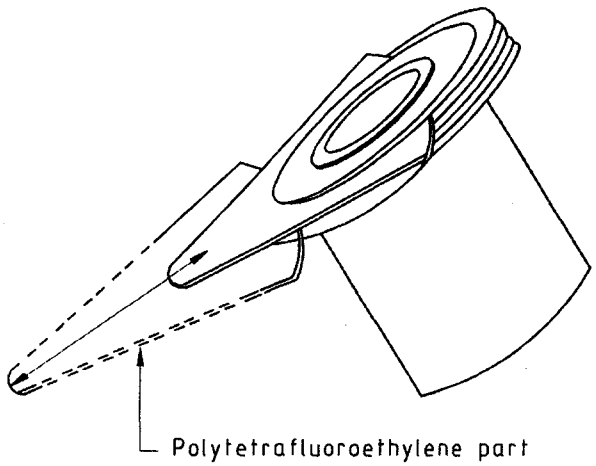


Figure 2 — Apparatus for the determination of mercury content

9.5.1.3 Digestion vessel (see figure 3), that consists of a stainless steel body that supports a polytetrafluoroethylene (PTFE) crucible, and a screw-on cap that has a PTFE liner to provide a PTFE sealing surface, or a similar digestion vessel.

A PTFE spout is snapped on the outside rim of the vessel to permit the quantitative transfer of the contents without contact with metal parts.

9.5.1.4 Diaphragm pump.



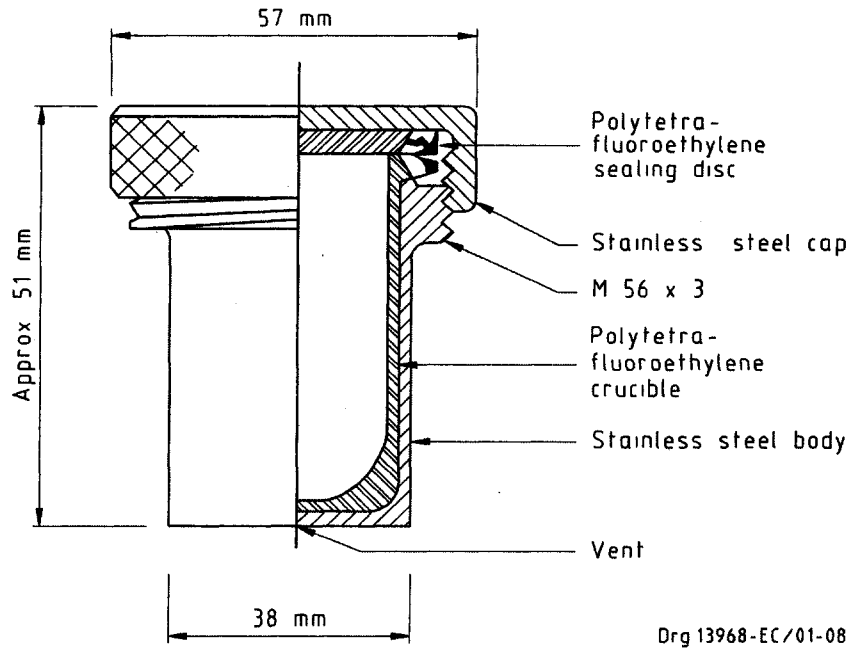


Figure 3 — Digestion vessel

9.5.2 Reagents

9.5.2.1 Hydrochloric acid, concentrated.

9.5.2.2 Nitric acid, concentrated.

9.5.2.3 Sulfuric acid, concentrated.

9.5.2.4 Diluting acid solution, an aqueous solution that contains 58 mℓ of the nitric acid and 67 mℓ of the sulfuric acid per litre.

9.5.2.5 Dilute hydrochloric acid, one volume of the hydrochloric acid added to nine volumes of water.

9.5.2.6 Stannous chloride solution, 5 g of crystalline stannous chloride ($SnCl_2 \cdot 2H_2O$) dissolved in 10 mℓ of the concentrated hydrochloric acid by heating, and diluted to approximately 50 mℓ with water. Remove trace amounts of mercury by bubbling nitrogen through the solution for 10 min.

9.5.2.7 Mercury standard solutions, as follows:

a) **stock standard solution**, 1 mg Hg/mℓ; and

b) **working standard solution**, 0,1 µg Hg/mℓ: dilute 1,0 mℓ of the stock standard solution (see (a) above) to 100 mℓ with the dilute hydrochloric acid (HCl). Then dilute 1,0 mℓ of this solution to 100 mℓ with the dilute HCl. Prepare this solution daily.

9.5.3 Reagent blank

Prepare a reagent blank.

9.5.4 Procedure

9.5.4.1 Accurately weigh out 1,0 g ± 0,1 g of the sample (see 8.1.2) (**caution**: do not use more than 300 mg dry mass; for materials with a high fat content, do not use more than 200 mg dry mass) into the digestion vessel (see 9.5.1.3), add 5,0 mℓ of the concentrated nitric acid (HNO_3), and close the vessel by tightening the screw cap. Place the vessel, without tilting, into an oven preheated to 150 °C for 30 min to 60 min or until the sample solution is clear. Remove the vessel and allow it to cool to room temperature. Unscrew the cap, transfer the contents of the vessel with the aid of the diluting acid solution (see 9.5.2.4) to a 100 mℓ volumetric flask, and dilute to volume with diluting acid solution. Reserve this solution for the determination of antimony as well (see 9.6).

9.5.4.2 Switch on the mercury hollow cathode lamp, and allow the spectrophotometer to equilibrate fully at a wavelength setting of 253,7 nm. Zero the instrument.

9.5.4.3 Pipette 20 mℓ blank solution, add 1 mℓ of stannous chloride solution and a magnetic stirrer in the reaction flask. Connect the absorption cell, the reaction flask and the diaphragm pump in series and in a closed system by means of PTFE tubing (see figure 2) minimizing the dilution of the mercury vapour by using tubing of the smallest diameter and of the shortest length practicable. Ensure that the distance between the lower end of the inlet tube and the surface of the sample solution in the reaction flask is at least 10 mm. Switch on the stirrer for 90 s, using a stopwatch, zero the machine again, then switch off the stirrer, switch on the diaphragm pump and take the reading after a few seconds to obtain a stable reading (blank reading).

9.5.4.4 For the standard reading take 1 mℓ of the 0,1 µg Hg/mℓ working standard solution, 19 mℓ of distilled water, 1 mℓ of stannous chloride and stirrer and repeat the above process.

9.5.4.5 Now pipette 20 mℓ of the sample solution, add 1 mℓ of the stannous chloride and a stirrer in the flask and repeat the above process.

9.5.4.6 After every five sample readings, another standard should be read to ensure the stability of the instrument. The mean of the standard readings is then taken.

9.5.4.7 After each reading the diaphragm pump should be kept on to flush the system.

9.5.5 Calculation

Measure the absorbance of the 0,1 µg Hg/mℓ working standard solution, of the reagent blank and of the sample solution.

If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the mercury content of the sample is less than 0,5 mg/kg.

Check for compliance with 4.10

9.6 Determination of antimony

9.6.1 Apparatus

Atomic absorption spectrophotometer. (Refer to the manufacturer's reference manuals for wavelength, slit width, flame conditions, etc.)

9.6.2 Reagents

9.6.2.1 Potassium iodide.

9.6.2.2 Antimony standard solutions, as follows:

a) **stock standard solution**: 1 mg Sb/mℓ; and

b) **working standard solution**: 0,01 µg Sb/mℓ.

9.6.3 Reagent blank

Prepare a reagent blank.

9.6.4 Procedure

9.6.4.1 Follow the apparatus manufacturer's instructions for the hydride generation for antimony, ensuring that the antimony is in the Sb III state before analysis, by treating the sample and the standards with an excess of potassium iodide.

9.6.4.2 Measure the absorbance of the 0,01 µg Sb/mℓ working standard solution, of the reagent blank and of the sample solution (using the sample solution obtained in the mercury determination). If the absorbance of the sample solution minus the absorbance of the reagent blank is less than the absorbance of the working standard solution, the antimony content of the sample is less than 1 mg/kg. Check for compliance with 4.10.

9.7 Determination of sulfur dioxide content

9.7.1 Apparatus (see figure 4)

9.7.1.1 Distillation apparatus, that consists of a round-bottomed distillation flask (see A in figure 4) of capacity 1 ℓ, that has three parallel necks. A 100 mℓ dropping funnel (see G in figure 4) is fitted into the centre neck and a nitrogen delivery tube (see B in figure 4) passes through one of the side necks to below the level of the liquid in the distillation flask (see A in figure 4). The other side neck is connected to the bottom-end socket of a vertically mounted double-surfaced condenser (see D in figure 4). Connected to the top-end cone of the condenser, there is a set of two U-tubes (see F in figure 4) of 20 mm tubing, connected with a crossover tube (see C in figure 4).

9.7.1.2 Nitrogen scrubber, that consists of a 250 mℓ gas wash bottle (see H in figure 4) connected by means of silicone tubing to the inlet of the nitrogen delivery tube (see B in figure 4). Both inlet and outlet tubes of the wash bottle are clamped off.

9.7.1.3 Heating mantle (see E in figure 4).

9.7.2 Reagents

9.7.2.1 Nitrogen gas.

9.7.2.2 Hydrochloric acid, diluted to one-half of the concentrated strength.

9.7.2.3 Hydrogen peroxide, a 3 % (by volume) solution neutralized to methyl red.

9.7.2.4 Standard sodium hydroxide solution (c(NaOH) = 0,1 mol/ℓ).

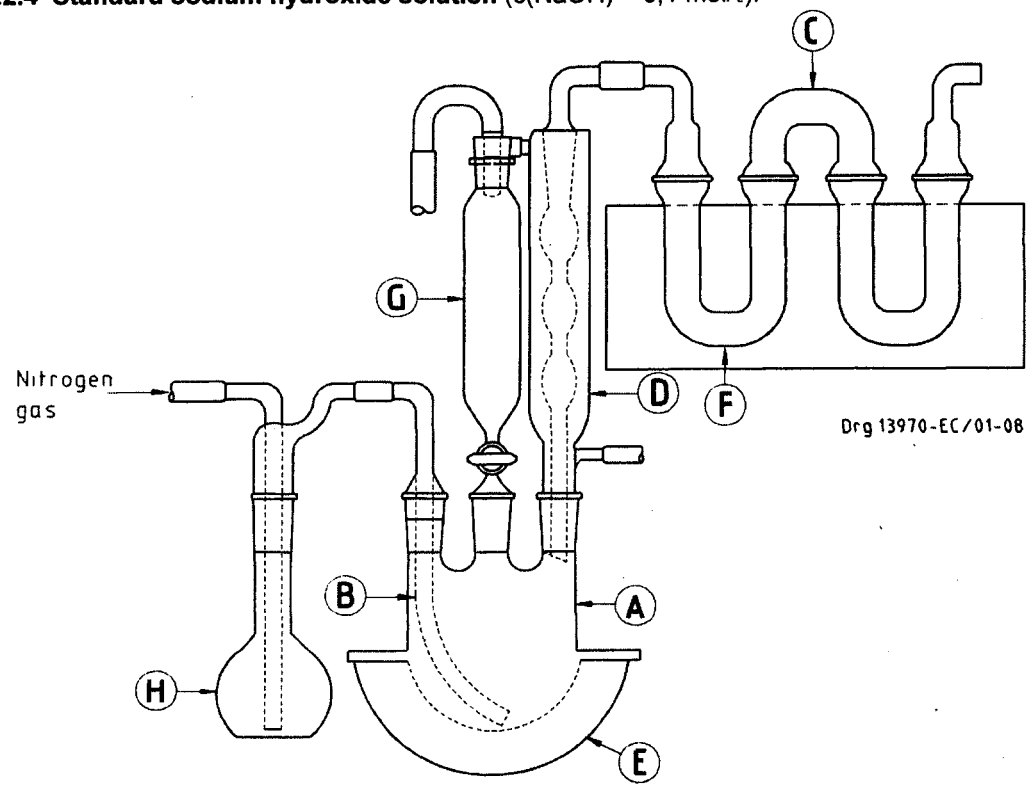


Figure 4 — Apparatus for the determination of sulfur dioxide content

9.7.2.5 Pyrogallol/potassium hydroxide (KOH) solution, 65 g of potassium hydroxide dissolved in 85 mℓ of distilled water. Grind 4,5 g of pyrogallol with 5 mℓ of water in a small mortar and transfer to the cooled KOH solution. Repeat the grinding and transfer with two further 5 mℓ volumes of water.

9.7.2.6 Methyl red indicator, 0,25 g of methyl red dissolved in 100 mℓ of ethanol.

9.7.3 Procedure

Transfer the pyrogallol/potassium hydroxide solution into the gas wash bottle (see H in figure 4). Introduce 15 mℓ of the hydrogen peroxide solution to each of the U-tubes (see F in figure 4). Accurately weigh 200 g of the test sample and transfer this test sample together with approximately 300 mℓ of water, through the centre neck into the distillation flask (see A in figure 4) and fit the

dropping funnel (see G in figure 4). Add 30 mℓ of the hydrochloric acid through the funnel into the distillation flask (see A in figure 4) and close the funnel's stopcock.

Start the nitrogen gas flow at a slow steady stream of bubbles. So heat the distillation flask as to cause refluxing within 20 min to 25 min. Reflux steadily for 1,5 h.

Turn off the water in the condenser (see D in figure 4) and continue heating until the inlet joint of the first U-tube shows condensation and slight warming. Disconnect the condenser and turn off the heat. When the joint at the top of the condenser cools, remove the crossover tube (see C in figure 4) and rinse it into the second U-tube. Attach the crossover tube to the exit joint of the first U-tube and rotate until the open ends touch. Add a drop of the methyl red indicator, and titrate with the standard sodium hydroxide solution while mixing by gentle rocking just until a clear yellow colour occurs. Titrate the second U-tube similarly.

Record the total volume of sodium hydroxide needed for the titration (1 mℓ of a 0,1 mol/ℓ NaOH is equivalent to 3,203 mg of sulfur dioxide).

9.7.4 Calculation

Calculate the sulfur dioxide content, Φ, expressed in milligrams per kilogram of product, using the following formula:

$$\Phi = \frac{V \times 1\,000 \times 3{,}2}{m}$$

where

Φ is the sulfur dioxide content, in milligrams per kilogram;

V is the volume of the standard sodium hydroxide solution used in the titration, in millilitres; and

m is the mass of the test specimen, in grams.

Check the result for compliance with 4.10.

10 Methods of microbiological examination

10.1 General

Use aseptic techniques throughout the examination.

10.2 Laboratory glassware

10.2.1 General

Ensure that all glassware used is resistant to repeated heat sterilization and that the glass is free from inhibitory substances such as heavy metals and free alkalis. Borosilicate glass with an expansion coefficient of less than 6×10^{-6} K^{-1} is recommended.

10.2.2 Bottles (universal)

Bottles that have standard plastics or metal screw caps, and that have a nominal capacity of

a) 30 mℓ,

b) 100 mℓ,

c) 250 mℓ,

d) 500 mℓ, and

e) 1 000 mℓ.

10.2.3 Culture tubes

Rimless cylindrical tubes that have hemispherical ends and a nominal wall thickness of 1,5 mm, and of diameter and length

a) 16 mm × 160 mm, and

b) 20 mm × 200 mm.

Plug these tubes with cotton wool plugs or with plugs of a foam rubber suitable for autoclaving. Alternatively, use screw-capped tubes of similar dimensions.

10.2.4 Graduated pipettes

Total delivery pipettes for bacteriological purposes only, that have an outflow opening of diameter 2 mm to 3 mm, are graduated in units of 0,1 mℓ, and are of sizes to deliver 1,0 mℓ, 5,0 mℓ and 10,0 mℓ.

10.2.5 Petri dishes

Petri dishes made of glass or of wettable polystyrene, and of diameter and height 90 mm × 15 mm.

10.2.6 Reagent bottles

Bottles of capacity 50 mℓ and 100 mℓ and that have polypropylene or other plastics stoppers of such design that they can be used to deliver drops of the reagent.

10.3 Equipment

10.3.1 Autoclave

A pressure vessel that is capable of producing steam (or that is connected to a central steam source) and is capable of withstanding a pressure of 300 kPa and of attaining a temperature of 121 °C ± 1 °C within 10 min of the beginning of the sterilization cycle.

10.3.2 Incubators and water-baths

Incubators and water-baths that have thermostatically controlled heating and cooling devices, and that are so fitted with means of circulation that the temperature of the total enclosed space is maintained to within 0,5 °C of the thermostat setting.

10.3.3 Hot-air oven (for sterilization by means of dry heat)

A thermostatically controlled oven, heated by electricity or gas and so fitted with means of circulation that the temperature of the total enclosed space is maintained at 170 °C ± 5 °C, the heat supply being such that the working temperature is regained within 10 min of the momentary opening and closing of the oven door.

10.3.4 Homogenizer

A mechanical mixing apparatus of either a rotating or a pulsating type, and that has sterilizable containers in which a homogeneous dispersion of the sample and the prescribed diluent can be produced. The sterilizable containers may be of glass, metal or a suitable plastics material. The homogenizing procedure shall not reduce the number or viability of the microorganisms in the sample.

10.3.5 Forceps

10.3.5.1 Type

Round-tipped forceps that have smooth inner surfaces to their jaws.

10.3.5.2 Sterilization

Sterilize by dipping in methylated spirits or technical methanol and then igniting the adherent liquid. Alternatively, use any other suitable method.

10.4 Media and reagents

10.4.1 General

10.4.1.1 Water

Use only glass-distilled water, or demineralized water of equivalent purity, that is clear, colourless and free from visible suspended matter, and of which the pH value, measured at 25 °C, is in the range 5,0 to 7,5.

10.4.1.2 Quality of ingredients

In the preparation of the media and reagents, use only ingredients of quality acceptable for microbiological purposes. Use anhydrous salts unless otherwise specified.

10.4.1.3 Accuracy

Except where otherwise specified, allow the following tolerances:

a) on temperatures ..... ± 2 °C

b) on masses ..... ± 1,0 %

c) on volumes ..... ± 1,0 %

d) on pH value ..... ± 0,1 pH unit

10.4.1.4 Dehydrated media

Many of the media required are obtainable in dehydrated form and, for uniformity of results, the use of such media is recommended. If such media are used, follow the manufacturer's instructions strictly regarding reconstitution and sterilization.

10.4.1.5 Adjustment of pH value

Where the final pH value of a medium or reagent is specified, so adjust the pH value that it is correct at 25 °C. If necessary, adjust the pH value during preparation and, in the case of media, before sterilization. Unless otherwise specified, use a solution of hydrochloric acid (c(HCl) = 1 mol/ℓ) or of sodium hydroxide (c(NaOH) = 1 mol/ℓ), as appropriate, to adjust the pH values.

10.4.1.6 Dispensing

Where specified quantities of media are to be dispensed into bottles, use 30 mℓ universal bottles (see 10.2.2(a)) or 16 mm diameter culture tubes (see 10.2.3(a)). Where bulk sterilizing is required, use any suitable glass container of the required quality (see 10.2.1). Dispense reagents into reagent bottles (see 10.2.6). Stir media constantly while dispensing.

10.4.1.7 Sterilization

When sterilization by autoclaving is specified, and unless otherwise directed, autoclave the medium at 121 °C ± 1 °C for 20 min. (This temperature corresponds to a pressure of 103 kPa above atmospheric pressure at sea level, i.e. 207 kPa absolute.)

10.4.1.8 Control of prepared media

Ensure, by suitable incubation tests, that prepared media are sterile and are capable of supporting the growth of the relevant organisms under the stated conditions of incubation.

10.4.1.9 Storage of media

Ensure that prepared media are carefully protected from exposure to heat and sunlight and have not evaporated or changed in concentration or in pH value, and that, unless otherwise specified, they are used within three months of preparation.

10.4.2 Buffered isotonic peptone water (diluent)

10.4.2.1 Ingredients

Peptone	10 g
Sodium chloride	5 g
Disodium hydrogen phosphate dodecahydrate	9 g
Potassium dihydrogen phosphate (KH_2PO_4)	1,5 g
Water	1 000 mℓ

10.4.2.2 Preparation

Dissolve the ingredients in the water, by heating if necessary. Adjust the pH value, if necessary, so that after sterilization it is 7,0. Dispense as follows:

a) 9 mℓ volumes into 30 mℓ bottles (see 10.2.2(a));

b) 99 mℓ volumes into 250 mℓ bottles (see 10.2.2(c)); and

c) larger volumes into bulk containers.

Sterilize by autoclaving at 121 °C for 20 min.

10.5 Preparation of the sample

10.5.1 Storage of the product

Store the product, of mass at least 200 g, for the minimum practicable period under such conditions that changes in composition are prevented or minimized.

10.5.2 Preparation of the sample

When necessary, thaw the raw or cooked product in its packaging at 5 °C to 10 °C until all the visible ice has melted. Ensure that thawing is completed within 18 h. Using a sterile cutter and forceps, remove 28 g to 35 g of the product and transfer it to a previously tared and sterilized homogenizing container suitable for use with the homogenizer (see 10.3.4). Add enough of the buffered isotonic peptone water (see 10.4.2) to obtain a 1:10 dispersion of the product. Operate the homogenizer in accordance with the manufacturer's instructions for just long enough to produce a homogeneous dispersion, i.e. operate rotating homogenizers for such a time that the total number of revolutions of the macerator blades is 15 000 to 20 000, but in no case for longer than 2,5 min. Use the 1:10 dispersion of the product so obtained for the tests described in 10.6 to 10.14 (inclusive).

10.6 Standard plate count

Use SABS ISO 4833 as published in Government Notice No. 1411 of 31 October 1997. Check for compliance with 4.11.

10.7 Enterobacteriaceae count

Use SABS ISO 7402 as published in Government Notice No. 831 of 7 September 2001. Check for compliance with 4.11.

10.8 Presumptive *Escherichia coli*

Use SABS ISO 7251 as published in Government Notice No. 125 of 9 February 2001. Check for compliance with 4.11.

10.9 *Staphylococcus aureus*

Use SABS ISO 6888-1 and SABS ISO 6888-2 as published in Government Notice No. 125 of 9 February 2001. Check for compliance with 4.11.

10.10 *Salmonella*

Use SABS ISO 6579 as published in Government Notice No. 399 of 1 April 1999. Check for compliance with 4.11.

10.11 *Shigella*

Use SABS SM 1195 as published in Government Notice No. 692 of 16 May 1997. Check for compliance with 4.11.

10.12 *Clostridium perfringens*

Use SABS ISO 7937 as published in Government Notice No. R1296 of 16 October 1998. Check for compliance with 4.11.

10.13 Pathogenic *Vibrio* (*Vibrio cholerae* and *Vibrio parahaemolyticus*)

Use SABS SM 1196 as published in Government Notice No. 692 of 16 May 1997. Check for compliance with 4.11.

10.14 Detection of *Listeria monocytogenes*

Use SABS ISO 11290-1 as published in Government Notice No. 1259 of 7 December 2001. Check for compliance with 4.11.

10.15 Test for efficacy of cleaning and disinfecting of plant, equipment and utensils

Use SABS SM 763 as published in Government Notice No. 918 of 30 July 1999. Check for compliance with 3.6.4.

10.16 Microbiological examination of water

Use SABS SM 221 as published in Government Notice No. 298 of 22 February 1991. Check for compliance with 3.4.